6674

The Natural Education Series

NEW METHODS *in* EDUCATION

Art
Real Manual Training
Nature Study

Explaining processes whereby hand, eye and mind are educated by means that conserve vitality and develop a union of thought and action

By J. LIBERTY TADD

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With a Wealth of Illustration

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PUBLISHERS' PREFACE

To the Students' Edition

This abridgment of Mr. Tadd's original and complete work is issued in response to an imperative demand for a smaller and more compact book for use by teachers and students. It omits the author's preface and Dr. Hailmann's address. But it gives entire Books One, Two, Three and Four of the complete and more expensive *edition de luxe*.

Of Book Five, only the first chapter is included herein. The table of contents indicates the nature of the important chapters of Book Five necessarily omitted herefrom, but which appear in full in the complete work. The index to this edition includes references to the omitted portions.

For a book not yet two years old, Mr. Tadd's work has exerted a profound influence throughout the educational world, irrespective of national boundaries. In the United States and Canada, its reception has been most gratifying, and these methods are being widely applied in public, private and parochial schools with results that justify the encomiums of Mr. Tadd's work pronounced by the most competent authorities. His own schools and classes are thronged by enthusiastic pupils and teachers, while his lectures and demonstrations before the various educational societies and art institutes of nearly all the large cities of America have drawn an attendance and created an interest seldom, if ever, equaled.

In foreign countries, Mr. Tadd's methods have attracted widespread attention. The leading society of teachers of art and manual training in Germany have translated this book into the German for use throughout the empire, and it has been published at Leipsic. In England, the book has been received with marked cordiality, and Mr. Tadd's lectures before the Society of Arts, London, at Kensington museum, and before various educational and art bodies of the leading cities in England, Scotland and Wales, have done much for educational progress. Government officials and educational authorities in France, Switzerland, Italy, Sweden and Russia have strongly indorsed

these methods and they have been welcomed in Australasia and elsewhere.

The methods herein are the result of more than twenty years' work, experiment and research with many thousands of pupils and hundreds of teachers, at the Public Industrial Art School, Philadelphia. "Nothing was taken for granted, and all processes had to stand the test of long experience and application to large numbers of pupils." Every known method was tested, the good retained and improved while the bad was rejected. As the author's preface truly says:

"We should develop a disposition disposed to energetic action or work, in response to stimulating thought a disposition that hungers and thirsts for right action, according to environment. Too often mere head-learning creates a wish or desire for good, without there being sufficient impulse in the organism to prompt the energetic action required to achieve it. For this purpose energy must be stored in the organism, and conserved by a training in action and deeds. until the working out of thoughts in deeds grows into a habit. To consume and waste the vital energy by beginning too early with abstract tasks and various forms of thought studies, is as needless as it is common. Too often I find the mind to be enfeebled, the memory weakened, the vitality abused and consumed by studies meant to strengthen; instead of methods being employed that would conserve and add to vitality, at the same time that the mind, the memory, the judgment and the imagination are being improved.

"In common with this improvement of the mental and physical being, there should be a development of the emotional being through the feelings -a love of action, a training of hand and eye to obey the mind and execute its orders, that fit both head and hand, heart and will, to cope with the problems of life.

"Nothing gives greater dignity to man than a complete realization of the power of being able to *do*. No joy is greater or more lasting than that received by doing well with the complete being, - brain, eye, hands, will and judgment,—all tools, God-given tools, to be trained and used."

* * * *

"Largely as a result of imperfect training, or wrong methods of education in youth, beauty and high quality of product are too commonly lacking in mechanical industries and in the world of literature and the fine arts. Our people excel in quantity of product, but not in quality. If they are to compete with the real art that characterizes so much of the fine products of the old world or of the Orient, then the art idea must be made more prominent in education. Art instruction should be so correlated with other methods as to help in reforming the educational errors alluded to. When this is properly done the rising generations will reach a development in the many that has heretofore been enjoyed only by the few. Our youth will come out of the early educational process sound in brain and body, strong of purpose, positive in application, trained in the use of hand and eye, with originality developed and judgment matured, possessing an ability and a capacity to use it that will manifest themselves in every art and industry. And this means a building up of character and a recognition of man's duty to humanity, and to God, by which alone are to be fostered the best citizenship, the largest human happiness and the fullest enjoyment of the marvels of this wonderful universe in which we live.

"Toward this high purpose the present work is a modest contribution. It suggests new methods of education, but only such as have stood the test of many years' searching investigation and practical experience. It aims to show by actual results that art instruction, real manual training and nature study, rightly conducted and properly correlated with other studies, should begin at a tender age and continue throughout the elementary and higher stages of education. This book is not merely a technical manual of drawing and design, of modeling and carving, of construction in wood and metal, or of the fine arts, but is designed to demonstrate the remarkable educational power of these methods when rightly used, the economy of their universal application, and their beneficial effect in helping to qualify the individual to make the most of himself or herself. It also gives an insight into the *modus operandi* of these methods, to the end that they may be more generally practiced by parents and teachers and fully comprehended by school authorities and people of affairs."

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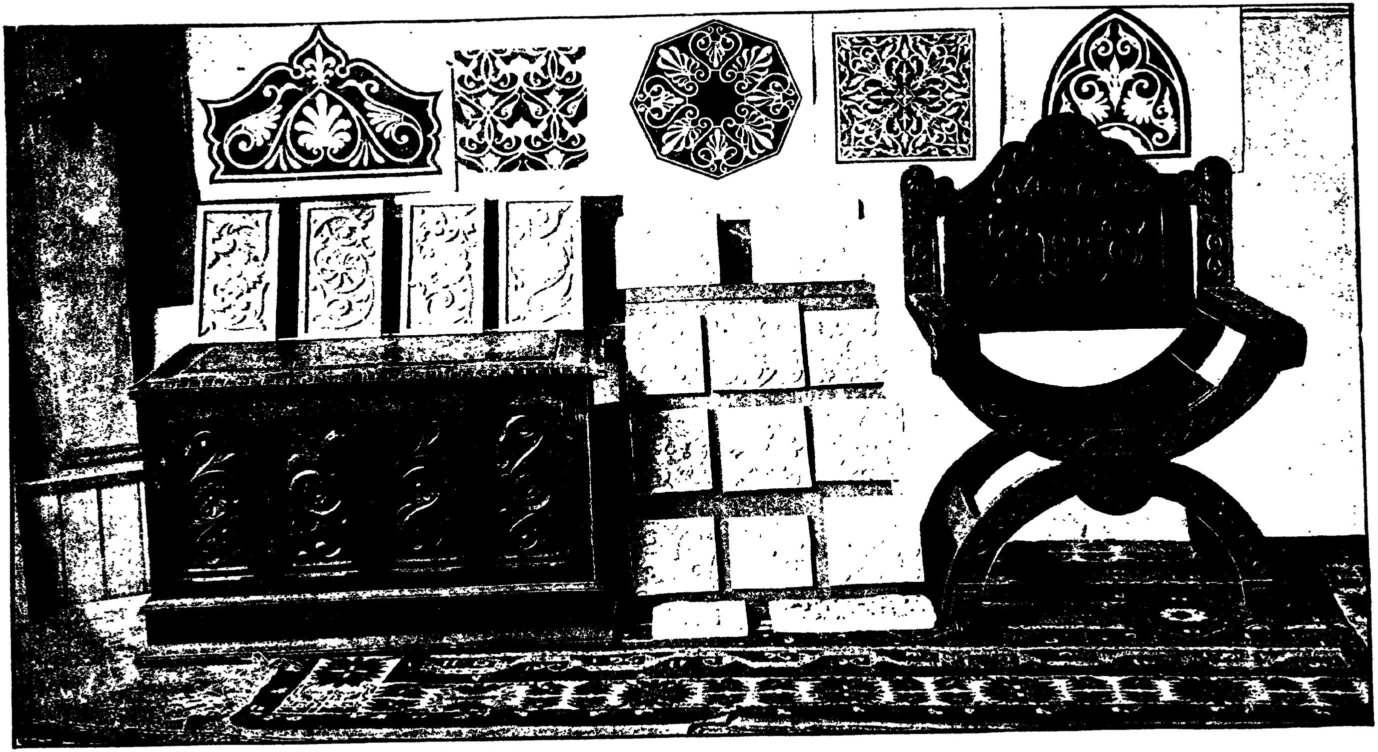
BOOK ONE

First Principles

"In childhood and in the earliest period of education, have more care for the *health* of the *body* than for the *mind*, and for the *moral* character than for the *intellectual*. Let nothing base or servile, vulgar or disgraceful, meet the eye or assail the ear of the young; for from words to actions is but a step. Let their earliest and first impressions of all things be the best. Let them be taught fully all the essential elements of education and as much of what is useful in a merely mechanical point of view as will have the effect of rendering the body, the soul, and the intellectual powers capable of arriving at the highest excellence of their respective natures. The merely useful, or absolutely necessary, matters of education are not the only ones that deserve attention, but to these should be added such as exalt and expand the mind and convey a sense of what is beautiful and noble. For to be looking everywhere to the merely useful, is little fitted to form an elevated character, or a liberal mind."—*Aristotle.*

PLATE TWO

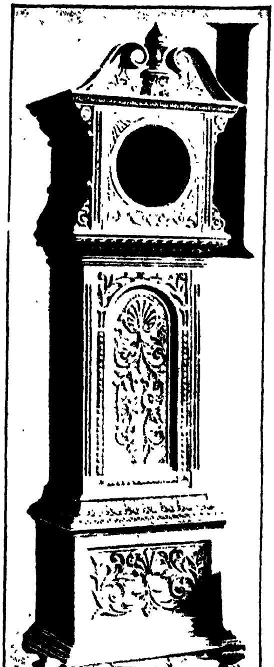


Children's Work, Grammar Grade, Philadelphia Public Schools

The upper part of picture represents designs for various purposes, made in color and black. The middle panels are designs modeled in clay. The chest (with the panels upon it) and chair represent carved work in oak, made by different pupils. All of this work is original in design and made by pupils of the grammar grades from the public schools.

CHAPTER I

Introduction



CLOCK
Designed, drawn and carved by high school boys

IN THE PROBLEM OF CHILD education, than which there is scarcely any subject more widely discussed, there enters equally with the mental, the consideration of the physical and the esthetic development. I consider esthetics—the science of the beautiful in nature and art, especially that which treats of the expression and embodiment of beauty in art—one of the important things in education. The young, of whatever circumstance in life, have a right to the joy that comes from knowing and perceiving beauty in nature and in art forms. If we are to plant anything in the young, or give them any capacity, it should be the power of enabling them to perceive in their environment "the good, the true and the beautiful."

Esthetic training necessary in education

This of course is to be done at the same time that we give the young the capacity to make a living. To teach them a trade

only, or to fit them for business, or commerce only—to make square pegs for round holes, as we often do—is a mistake. I have no sympathy with the manual training methods that make the use of tools and workshop exercises the main end. The pupils become simply machines, thoughtless mechanisms.* The first tools to be used and trained are the mind, the eyes and the hands,—the instrumentalities of the organism. To these our chief care should be given. It is of little use that the pupil has built a machine or performed a piece of work by mechanical movements, if his own organism is not complete, if his hand is not sure, his eye not true, and his mind not balanced.

The first tools

The marginal engravings and initials are mostly of children's work.

I make a plea for this organic skill first because I have tested many pupils from divers institutions, and have found almost invariably that without instruments of precision—rulers, compasses, gauges, calipers, etc.—they are powerless. In many cases they are simply plan-followers and thoughtless mechanics, without the elementary facility that small children can get spontaneously in a few weeks' practice of rational methods in manual training. They have been trained under traditional formulas to do certain things in certain ways, without any endeavor to have them realize the immeasurable life possibilities and potentialities planted in each person.

The methods advocated

The methods advocated herein for elementary work in education consist:—

1. In a practical development of the factors of the organism itself,—the hand, the eye and the brain—by the acquisition of their conscious control, to be followed by automatic control.

2. In the use at certain periods of powerful rectifying exercises to reform or correct awkward muscular movements

* "We teach boys to be such men as we are. We do not teach them to aspire to be all they can. We do not give them a training as if we believed in their noble nature. We scarce educate their bodies. We do not train the eye and the hand. We exercise their understandings to the apprehension and comparison of some facts, to a skill in numbers, in words; we aim to make accountants, attorneys, engineers, but not to make able, earnest, great hearted men. The great object of Education should be commensurate with the object of life. It should be a moral one, to teach self-trust to inspire the useful man with an interest in himself; with a curiosity touching his own nature, to acquaint him with the resources of his mind, and to teach him what there is in all his strength and to inflame him with a piety toward the Grand Mind in which he lives."—Emerson, "Lectures and Biographical Sketches," Page 134.

or habits, as well as for the purpose of gaining facility, balance, proportion, accuracy, magnitudes, fitness and grace.

3. Exercise in different mediums, as wood and clay, for acquiring dexterity and skill in shaping various ideas.

4. Exercises for acquiring accurate and permanent organic memories of environment: (*a*) From nature, at periods when impressions are most vivid (nascent period), from animals, flowers, insects, shells, etc.; (*b*) from art works and ornament of best periods; (*c*) creative designing in various materials.

Rotation of branches of work

Perhaps one of the most radical features of my method, apart from those of ambidexterity and memory drawing, and one that must be understood as being applied in all our schools, is the rotation of the branches of work. The pupils do not take a course of drawing alone, or of modeling alone, to be followed with another course for a certain period, but in every grade from the lowest the children are required to work in the four departments of drawing, designing, clay modeling and wood carving. By drawing all forms first on paper, then in soft clay, and then in tough wood, all the possible physical co-ordinations are acquired in the different materials. The work of making form in clay reinforces the drawing; carving in wood reinforces the modeling. Designing forms in clay and wood, as well as on paper, compels originality and invention, or the exercise of the creative capacity at every step of the work.

The method or system of rotation varies with the different schools. In some the pupils change from one branch to the other at each lesson; in others, at every fourth lesson; in others again, a piece of work in each branch is finished before the change is made. This method is very stimulating to the pupils, and especially shows for what they are best suited. The exercise of the opposite capacities gives them a chance to do work in the branches in which they show most deficiency. No exception is made with any pupil—all, in the elementary courses, must work in the various mediums, unless constitutionally defective.

Just as I insist that elementary manual training for the young must precede all special work,—such as joinery, cabinet

work, metal work, trade processes, or draughting, mechanical and architectural drawing, object drawing, etc.,—so I insist that the hand must, by this rotation, become familiar and experienced with form in these different mediums. All artists and artisans at once admit the reasonableness of this. To make the hand itself skillful is necessary before it can do its best with tools.

Make the hand skillful

By these methods all pupils without exception develop their capacities. Some get remarkable power and enter the diverse grades of art work at once, in various directions. All, however, acquire sufficient skill to enter the different minor industries with credit. All, according to their degree of intelligence, are prepared to do skilled work with tools and hands in the different vocations open to them, after very little preliminary training, because they have skilled hands, true eyes and a certain amount of power of expression and originality.

Memory drawing and ambidextrous drawing, as described in the following chapters, are made an important part of the course. By the nature-study drawing we endeavor to make permanent organic impressions of beauty that will be a joy to the pupils in their after lives, no matter how poor and sordid their lives may be.

So powerful is the influence of a knowledge of beauty and the joy that comes from it, that it is possible to make a contented mind, or a mind that will remain contented, if necessary, in the most toilsome drudgery. There is a certain amount of compensation in this. It is not necessary that the so-called "lower classes" should have small minds, or low minds. The mind can be expanded, elevated, even in the lowest stages of society. This is done by art methods rightly directed and by esthetic culture, especially that which concerns itself with the expression and embodiment of beauty in form, which has so important an effect on the organism.

Influence of beauty

The training of these activities has a higher outcome than the solely physical one. It ministers directly to a certain amount of moral training; it has distinct ethical effects.

Morality is embodied in nature. Ideas of goodness and badness are received from things. Whenever children are taught to use their own faculties, their powers of choice and of intelligent selection must become developed, until, by habit, perhaps by instinct, preference for the good and dislike for the bad become ingrained.

Moral training and its value

It is no more difficult to make children realize the immutability of moral laws than it is to teach them the immutability of physical laws. Just as a child knows the effect of gravity, or the action of fire upon the body, so it can be brought to a realization of the distinction between the true and the false, the beautiful and the ugly; the standards of these qualities are absolute. Perception of them, strengthened by the force of habit, must come through the repetition of intelligent observation and the union of thought with action.

If we are ever to get true morality as well as intellectuality, it will be by making the young recognize the rightness of things. Material things,—plants, flowers, crystals, animals,—never cheat. All nature hums and vibrates with truth. Water, trees, sounds from metal, stones and wood, ring out truth every time. So will the children when, with loving recognition attained through trained observation and action, they realize the divinity and mystery of things. Only by enjoyment and love of work can this be effected, and to do this teachers must inculcate the higher objects of work, of struggle, of sacrifice and unselfishness, showing that only by work, earnest endeavor, and unceasing effort can we reach the highest planes of physical, mental and ethical culture.

To get true morality

Experience has gradually taught the author to change a great many of his ideas and plans, until he has come, during the last few years, to fundamentals in this direction.

For educational purposes, he has found that the teaching of a trade is not the most beneficial thing that can be done for a boy or a girl. He has also learned that to take fifty boys and make them all carpenters, or plumbers, irrespective of their different dispositions and tastes, is a wrong, a great wrong.

Trade teaching not beneficial

This is one of the tendencies of our modern systems of education that can be readily seen in most cities now where the industrial and the mercantile ideas have been overdone, where children are fitted even in the high schools and other institutions for commercial courses, irrespective of any natural capacity they may have. A great many institutions teach typewriting, stenography, bookkeeping, penmanship, to all comers, irrespective of their capacity, and by degrees the market has become overstocked.

There are more clerks than we can care for, and fewer artisans and skilled workers than are needful. In response to an advertisement in almost any city requesting clerical help, hundreds of applications may be received. In some cases the applicants volunteer to work for the experience, or for nominal pay. If an advertisement is put in the paper for a skilled hand worker in almost any of the trades, the reverse is true; there will be very few applicants, and wages must be paid in proportion to capacity.

Discover capacity, then educate it

It seems reasonable to me, and the proper thing to do, that we should fit our children to enter into pursuits to which they are specially adapted, where there is not already a crowd, pushing each other to the wall. It seems to me that this should be especially the object of the newer institutions of learning that are founded expressly for the purpose of helping people to help themselves. I consider that it is wrong to produce more typewriters, stenographers, bookkeepers and penmen, when the market is already overstocked. It seems an injury to the ones already working. Of course I know that by struggling, a percentage of these newcomers will achieve distinction, that they will gradually work their way to the top. But how about the large percentage who do not have much capacity to struggle, who do not have even sufficient energy to make the required movements to change their environment and to start anew in some other line, who remain drudges on account of this lack of disposition, or this mental inertia? Certainly, we should consider them.

My first idea in teaching, years ago, was simply to give several kinds of drawing,—drawing from objects, mechanical drawing, etc., and to teach a few trades. We taught carpenter work, designing, painting, pottery work, mosaic setting, metal chasing, and needle work of several kinds, at different times. The children and adults elected their branches of study. It was gradually found, however, that this was not the best plan. Three or four years of carpenter work, except in the limited operations of the trade, did not develop the eye and the hand, and proved futile in developing the mind and the judgment. The operations being mostly mechanical, and being performed by instruments of precision, every time a board was cut it would be marked off, every time a piece of wood was cut it would be gauged; the caliper, the T square and the ruler were constantly used.

First experiments

The sentiment of Michael Angelo gradually entered my mind: "We must carry our instruments of precision in the eye, not in the hand." Only after striving and struggling up above the use of instruments of precision, rulers, compasses, mechanical methods, do we recognize their futility in developing the mind, the judgment, the eye and the hand. The mechanical methods had to give way, one after the other, after trial in various directions. Only by trying and testing the old methods, and thus proving their fallacy, did we emerge into the light of better ways.

Feeble art methods, trade training, abuse of geometric forms and blocks, false, artificial and unnatural systems devised for money-making purposes, were tried and proved wanting. A number of trade processes were tested with similar results, until we actually, by experience, came down to fundamental facts, and on these we have built up a method reasonable, feasible and without great cost, adapted to all grades, from child to adult; a plan that can be applied without friction to every kind of educational institution, and limited only by the capacity of the individual; a method covered by natural law, working with the absolute precision of nature itself; a process that

Fundamental methods

unfolds the capacities of children, as unfold the leaves and flowers; a system that teaches the pupils that they are in the plan and part of life, and enables them to work out their own salvation on the true lines of design and work as illustrated in every natural thing.

Educators, scientists and doctors express hearty good will

Many educators, scientists and doctors have expressed their hearty good will toward the method outlined in this work, anything saving wear and tear of mind and matter appealing to them directly. Much time and energy are saved to pupils working this way; their understanding of things being quickened, they have less drudgery to go through to obtain facility.

The work is chiefly and above anything else to be desired for its disciplinary value as an educational method, apart from its practical value, in that it cultivates judgment, proportion, symmetry and fitness. In drawing on blackboards, the children take exercise. The work is done on so large a scale that they have to move about, no small work being allowed. The children avoid the habit of peering at lines, shortening their focal length. This is one great trouble in the drawing, reading or writing as usually followed in schools. In many instances much damage is done to sight. Too many children wear spectacles in these days.

Original Design

CHAPTER II

Development of Bent or Disposition

Enlarging Drawings

THIS BOOK IS ALSO PRIMARILY written to aid people remote from art centers and educational opportunities. It is not so much with the idea that with the book they can learn to do the work, as it is in the way of suggestion to those who cannot be reached by other means. The millions of such people, young and old, may perhaps be helped by knowing that most of the ideas embodied in this book have been gained in the hard school of experience.

A large portion of the children in the various schools and in the different communities are especially endowed or have a native capacity for hand skill,—the power to do skillful work in many diverse pursuits. There is a much larger proportion of these than many people believe. This has been demonstrated by numbers of experiments I have made and from graded tables based thereon for a period of years. This is true of the upper classes of society as well as the lower.

Capacity for hand skill

Experiments have been going on in a number of countries, and in a variety of institutions and prisons, which have proved conclusively that what have been termed "the lowest and most degraded members of society" owe their condition partly to the lack of this capacity and of their hand craft being undeveloped. I have found in penal institutions in which I have taught or conducted classes, a fair proportion of pupils who, with development and training, would have shown extraordinary capacity. The same is also true of people who have unfortunately been bred in the lap of luxury, and who have never been taught to do anything, or had their capacities in these directions trained. A very fair proportion of the pupils in some of the best private schools and colleges, where I have been able to come in contact with numbers of this class, show remarkable skill and capacity.

Lack of hand skill one cause of poverty

For a series of years I have kept tally of numbers of cases among parents, care-takers and friends of children who have visited my various schools. Test questions put to them show that a very large proportion have never been able to develop their bent or disposition, and in the course of time and experience they have found this out. One of the commonest statements in my schools is that made by parents, when they say their primary desire in bringing the children is that they may get the training which they themselves did not have and which they should have had when they were young. It is remarkable how many parents acknowledge that they feel now that in youth they had a taste for certain branches which they were never able to carry out, perhaps an inclination toward mechanics or construction, or a feeling for form, and it is sorrowful to hear the regret that is sometimes thus expressed.

Importance of finding out the "bent" of the young

If the methods in this book are good for anything at all, it will be for the fact that we do find out by their aid the disposition or "bent" of the pupils. I am inclined to think that this capacity to find out the especial capacity of pupils by various tests is one of the best parts of our work. Surely this is one of the first things to be done in education. Even if the children are to be compelled to follow certain distasteful pursuits for

Illustration 11

Freehand Manual and Memory Drawing

money, there is no reason why they should be debarred from a glimpse of, or an insight into, the possibilities and potentialities they have or might have. Much might be saved in the way of care and worry to the individual, and much gained in the giving of a capacity to enjoy, by following out certain of the lines herein contained, as a recreation or a hobby. Everyone recognizes the value of this to-day.

Skillfulness beneficial and a means of mental expansion

Few parents realize the great variety of skilled pursuits that are now open in the various directions of hand work, as compared with a few years ago. The old idea that the only respectable pursuit for one's child is a profession has been worn out for many years in this country, but it persists in more places than would be suspected, simply through ignorance of the enormous expansion of the industrial world of to-day, with

its opportunities and fortunes. I am so penetrated with this idea from my experience that I consider it wrong for any child in any condition of life to be debarred from at least a portion of this fundamental work. Even in the professions, such as that of clergyman, doctor or lawyer, judgment, reason and imagination are required. It is not fair that men and women of affairs should be debarred from the extra power and mental expansion that these capacities or opportunities give them.

Real manual training a means of finding out capacity

Again, many kinds of business are so much alike, requiring some technical skill in diverse directions, that it is almost impossible for those entering on a career to be able to find out in a few years whether they are especially suited or adapted to it. It is very disheartening gradually to realize in the course of time their lack of fitness or capacity for the pursuit they are following. This is illustrated by thousands of cases all over the world. I have in mind some bitter experiences that I have suffered individually. I have a vivid recollection of a dentist who should have been a farmer. I have seen many doctors and surgeons who should have been in the possession of perfect control of their hands and fingers, yet who seem to be possessed of "thumbs" only. Every year of experience will show us such distressing cases, and few can attain to positions of responsibility and care without coming in contact with many instances of this kind.

Necessity of an energetic disposition

The author's hope is to help that great army of persons who feel that they are not especially gifted or endowed in anything, and to make them able to expend their energies to advantage in some practical way—energies that are too often wasted and puttered away in trifling work or labors that accomplish nothing in ministering to their welfare. Too often many fail in life, though possessing good intentions and desire to do their best. They try one thing and then another, never becoming thorough in any direction, and never becoming able to earn a proper or sufficient income. Their work is only half-hearted, they do not feel that it is their mission, and consequently movements are made that are not energetic enough and little product results.

Satisfaction is essential to the mind and body. The organism is fortunately so constituted that a satisfying income or a full purse is intimately related to a contented mind and an energetic body.

Satisfaction essential

How many teachers there are who, through small pay and physical and mental inertia, do injustice to their pupils. While frequently well meaning and endowed with altruistic desires, they fail to accomplish anything; nay, they even do harm and injury, because to be a good teacher requires essentially the inspiration that the art of teaching is divine. It is a mission to teach children having souls. The teacher must especially realize that each mind or soul is an immortal part of the future heaven he or she is helping to build.

Inspiration by performance of deeds

How differently one feels and works when the right thing and the right way have been found! How much more intense every thought and action become. This is one of the objects of this book—to show ways and means that transform the dull routine and drudgery of teaching into a pleasurable and profitable means to the welfare of many.

Blackboard Drill Work in Design

CHAPTER III

Importance of Contact with Things instead of the Symbols of Things *

Bench Work

Importance of various sense impressions

IFE IS A SUCCESSION of lessons that must be lived to be understood." "Experience, and not memory, is the mother of ideas." My desire is to impress all with the importance of developing the organism through each of the different sense channels, in addition to the verbal or word centers. The tendency with the present modes of education is to overtax the memory and overload the mind with studied words. Instruction by telling is a feeble mode of impressing the mind. "Actions speak louder than words." Only in proportion to my experience can I understand the symbols of things, that is, words. Words are empty sounds unless accompanied by clear ideas or thoughts of the

* I am indebted to Dr. Hailman for many of the ideas expressed in this chapter.

things signified. I can have true ideas or false ideas only in proportion to my experience.

"Ideas are symbolized by words. Words are signs for natural facts. Every object, rightly seen, unlocks a new faculty in the soul and thus becomes a new weapon in our arsenal of power." It is important in the first place to secure ideas, then to connect these ideas with intelligible words. "The content of a word depends upon the character of the idea symbolized." To the child the word symbolizes no more than his own ideas. The supreme thing, then, is (1) to secure ideas, (2) to connect these ideas with intelligible words, (3) to combine these ideas and words with appropriate actions, (4) to secure a complete working of this mechanism in each instance; this union of securing thought and action so that it works unfailingly and in a measure becomes conduct or behavior.

Importance of getting ideas first

Every natural object bristles with facts, teems with ideas. I should be bristling with facts, I should teem with ideas! The object should inspire me to become eloquent, to give expression through my various channels of facts and ideas. By the tongue I should vocally give expression to ideas. I should be able to write ideas, and should give expression to them by means of drawing, constructing, modeling, painting, etc. By this means we make thought fabric and mind structure.

Thought fabric built by variety of expression

We consider too much the symbols of knowledge instead of the sources of knowledge—the objects, facts and processes of nature in time and space. How can we expect to grasp the ideas represented by these objects, facts and processes unless we embody them? We too often introduce our children to the sources of information which books supply, instead of to those sources which nature and experience supply. If we give them information from books only, there are a consumption of vitality, a dissipation of energy, a diversion of the attention and a prevention of the impulse which prompts to action.

Dissipation of energy

On the other hand, if we introduce our children to the sources of knowledge, the facts, objects and processes of nature, there are a conservation of energy, a storing of vitality, an

inspiration, and a compelling of the attention that gives a strong, active impulse to the feelings and emotions which prompt to action.

Assimilate facts, not words only

We must, therefore, "assimilate facts, not words." If we do this, we make our thinking structure and mental fabric at first hand. This cannot be done if we assimilate words alone; only partial ideas can be formed that do not yield complete mental structure. Ideas should grow in clearness, vividness, comprehensiveness and accuracy by repetition. Expressions through the various sense channels should be related and associated in thought. Only thus can we get the appropriate impulse that prompts to action; only thus can we get that right action which is the fruit of a good education.

Repetition and the force of habit

But not only must we get information first hand, but we must register it organically by repetition. It must become a part of us, ready to be used when needed. "The very essence of knowledge is in possessing it and in being able to use it."

Vital union of head, hand, heart

I want to make clear, if I can, the union which exists between the head and the hand, also the union which exists between the head, the hand and the heart. You cannot rightly train the one without influencing the others. As Dr. Balliet says: " All hand and eye work involves brain work, and the distinction between hand work and brain work is not true."

All the intellectual forces in the world will not enable me to know the texture of velvet or sandpaper until I touch them, then at once the knowledge is awakened in my brain through my hand and eye. I cannot rub my brain against the cloth or the paper, I do it through my hand and eye. I cannot know the shape of so simple a thing as a common comb through the touch alone. I must see it before I can get the right conception of it, my touch not enabling me to feel the space between each tooth.

Few persons get complete and correct ideas of the various senses as organized, how distinct and separate they are, and yet how mutually dependent and connected. I can feel with my coarse fingers through very fine skin the most delicate pulse; I

Illustration 14

Wood Carving Class, Public School of Industrial Art

can readily feel the blood bounding along, on some wrists I can even see it, yet with the tongue, that has such wonderful sense of touch for many things, I cannot get the slightest sensation in this direction. This curious fact is mentioned by Sir Charles Bell, the discoverer of the functions of the nerves. The sense of touch must sometimes be helped by the sight. It is often difficult to touch certain parts of one's hand with the other without the aid of sight.

Various sense impressions organized into concrete ideas

Drawing should be used as modes of thought expression quite as often and as much as speech and writing; for while pupils gain accuracy of perception, they also gain facility of expression, the terms interacting. Some one has said that the foundation of right reasoning is accurate perception. How seldom would pupils shirk work and how pleasant it would become if drawing were used as a mode of expression. Drawing and art work would perforce redeem the sordid homes of many pupils by teaching a certain amount of beauty and

Drawing a mode of thought expression

creating a desire for it, instead of leaving them to dissipate their energy by the reading of senseless novels and trashy papers. Drawing properly taught gives a disposition to do something. I do not by any means mean the kind of drawing given usually to-day, but I mean drawing as a mode of thought expression that will be used as often as speech and writing. See what the product would be. See what the product is already in some of our schools where the children produce things of use and beauty for the adornment of their homes.

Book-bred people indisposed to action

The inspiration to perform deeds, to make movements, is so important that I cannot help calling attention to it continually. Prof. Reuben Halleck says: "A glance around us is nearly certain to discover some persons of marked deficiency in the world of action. They may like to learn and to continue absorbing knowledge, but they never make any worthy use of it. A visit to the reading rooms of any library will enable us to find chronic, sponge-like absorbers of whatever is written. Their very faces come to have a dreamy, relaxed expression. These persons generally fancy that they are going to do something soon. But the motor paralysis becomes more and more complete. Sometimes boys are allowed to bury themselves in book after book until action becomes extremely irksome to them. They love to absorb ideas and to direct all their motor energy into dreaming or castle-building. In the case of the majority of people, motor action needs to be cultivated and to be directed to a definite end. It is not enough for one to form an idea of becoming a great man. He must do things to make himself great."

Importance of visual memory

Read also Sir Francis Galpin on "Inquiries Into Human Faculty and Its Development:" "A visual image is the most perfect form of mental representation wherever the shape, position and relations of objects in space are concerned. It is of importance in every handicraft and profession where design is required. The best workmen are those who visualize the whole of what they propose to do before they take a tool in their hands. Strategists, artists of all denominations, physicians who

contrive new experiments, and in short all who do not follow routine, have need of it. The pleasure its use can afford is immense. * * * * I believe that a serious study of the best method of developing and utilizing this faculty without prejudice to the practice of abstract thought in symbols is one of the many pressing desiderata in the yet unformed science of education." Prof. Halleck says further: "The great danger from castle-building and inveterate novel reading lies in divorcing ideas from action. The dreamer accustoms himself to become incapable of action."

I am convinced that some of the present methods of education devitalize society. This is a question agitated among educators. And it has been repeatedly suggested that mere book-learning does not diminish crime, but that it increases crimes which involve the exercise of penetration and scholarly training. A writer on this subject asked recently "Whether the short-sighted, illiterate or the crafty, educated man of evil design was more dangerous to society." Education as at present conducted will not develop the best potentialities in man's nature, will not enable him to bring into action the best that is in him. It is unreasonable to think that a knowledge of the "three R's" will do this. It must be something very much more. It must be a training to obtain habits of self-reliance and self-control and the golden fruit that results,—a training that will make people think and act more instead of less, that will open up the immense realms of ideas so few reach.

Too much reading divorces ideas from action

Under the old method of education, the time being chiefly given to the study of words,—printed, written and spoken,—the printed and written words (symbols for ideas) are studied at the expense of the ideas themselves. This leads to false or partial ideas and weak imagination. The vision is used too much, the pupil reading and writing at the expense of eyesight. The focal length is frequently shortened, and the too frequent use of fine finger movements required in writing cause, in many cases, nervousness and chorea. Some of the time given to writing should be given to larger movements, to hand and arm

Words studied at the expense of ideas

movements, finger co-ordinations coming last. This also improves the writing.

The too frequent use of the eye and ear in the old methods causes injury not only to the eye, but also to the verbal memory. Still worse is it that, as a result of these wrong methods, facility in other modes of expression and impression—such as drawing, painting, making, creating, etc.—becomes dormant or torpid through never having been used.

All channels for improving the mind to be used

Under the new methods of education, all the channels for impressing the mind of the child should be used as much as possible. Through the vision, the touch, muscular sense, hearing and speaking, impressions should be assimilated, and through the same channels expression should be given to the ideas formed by creating and designing in diverse mediums.

The soundest mental fabric is built by the perceptions that are the most accurate, and that call into play for their expression the largest groups of associated and connected motor centers; sense movements, incoming and outgoing. Thought and action are organically related, and education consists in firmly connecting them by repetition and habit. I am convinced that the so-called "thought studies" are valueless unless they are firmly locked in the mind by systematized impressions from things by action and that their value depends on the facility of expression which comes from accurate perception.

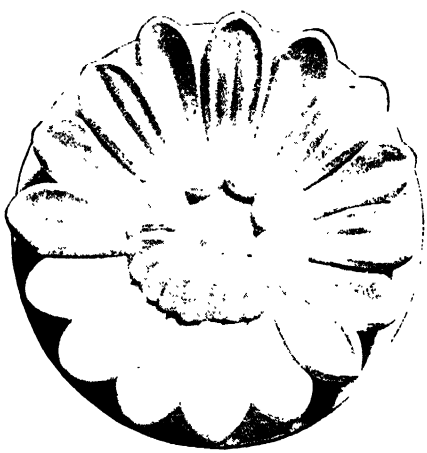
Automatic obedience of the hand

Real manual training is the basis of all elementary education, because "the hand is the instrument of instruments and the mind is the form of forms" (Aristotle). Through the union of the brain and the hand, the products of nature have been made useful and valuable to man, and the work of the world has been accomplished. The hand should be made spontaneously obedient to the mind; it should start forward instantly to obey the mind by the appropriate movement, as the tongue usually obeys. Book study and word study, preaching and praying, will not give this desired disposition to work and action. It must be the result of rational training and attention to its needs during the period of growth.

I firmly believe that we need to-day trained and skillful hands more than we need fluent tongues. Yet I also consider the training herein advocated the most essential for the getting of true eloquence of the tongue. Right ideas and right deeds are the primary inspiration for both. To deprive a child of this training is to prevent it from ever knowing the potentialities of its own nature; to prevent the child from knowing and loving nature as she should be loved—" the fountain and source of all education, science, art and religion."* To deprive the child of this training is to rear it in ignorance of its power to use hand and eye, a power that can be mastered at an early age; and a power the proper development of which aids so much toward practical success in the actual work of life, while also aiding the physical, mental and spiritual welfare of the individual.

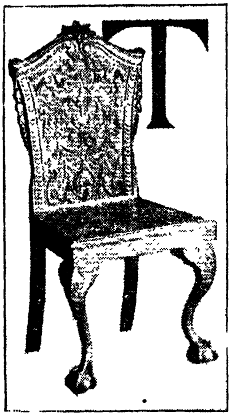
Right manual training will give a love of nature

* Dr. G. Stanley Hall.



CHAPTER IV

Distinction Between the True and False in Manual Training



Different kinds of manual training

THE OBJECT OF THE NEW EDUCATION is to get ideas in a rational way at first hand, by using the activity of the child. It is difficult to decide which kinds of manual training are educational and which are not; which kind of manual training should be used and which not. Many manual exercises are valueless for training and education, and yet nearly all kinds of manual training educate to a degree. It is amusing to see the variety of opinions, even among intelligent people, as to what kind of manual training is best for educational purposes. The manual training that should be given is that which develops in the individual:

1. The art of building ideas by using most of the channels of *im*pression and most of the means of *ex*pression.

2. Accurate perceptive powers.

3. Facility of expression, not only in writing and verbally, but in a variety of ways through the hands.

4. The strengthening of thought fabric and mind structure, and capacity to use the same.

5. Most skill in the shortest space of time.

6. Fitness for the greatest number of fundamental operations or pursuits.

The power of expression in language, written or spoken, depends on accurate perception of things, on the power to form clear, definite ideas. Some kinds of manual training dull the power of accurate perception and limit the power of assimilating new impressions. Some forms of so-called manual training are so mechanical that they prevent co-ordinations that otherwise would have been made, consuming valuable time at the most vital period. Under this head I include such operations as paper cutting and folding, stick laying, sloyd, whittling, sawing, planing and joinery work and other merely mechanical movements.

Methods that prevent real manual training

Nothing can be more absurd than the extravagant claims made for sloyd and several similar narrow mechanical methods. For instance:

"That the knife is the only tool by means of which alone a finished object can be correctly made" "That it is the most familiar and the least mechanical of tools." "That it necessitates greater concentration of thought and attention than any other tool."*

Stupid claims for sloyd

"You can acquire a sensitiveness of touch and corresponding correctness of eye more effectively by the judicious use of sandpaper than in any other way." "The curve can only be cut by hand, and hence in other courses of woodwork curved forms are eschewed, except those that can be cut with a fret saw and drawn with an 'architect's curve.'"†

Such statements carry their own condemnation to any thinking person who really understands what true hand skill or manual training is. I have seen a sign painter so drunk that he could not stand, but had to sit, yet he was able to space out and block in letters with wonderful accuracy. I have seen a carriage

* "Sloyd," Larson, Boston, 1893.

† "A Plea for Sloyd," by T. G. Rooper, Reprinted from "Hand and Eye" 1892.

painter in the same condition striping or painting long lines free hand on wheels, with marvelous precision. No real carver in wood ever uses anything but his eye, hand and chisel, no matter how elaborate the curves are. These operations are not the results of genius, they are simply the results of skill, with very few physical co-ordinations, and are such as all children can learn, without exception.

Limited skill

The utilitarian idea has been considered too much. The "useful model" has been done to death, the articles made being of the nature of bread boards, salt boxes, towel racks, knife boxes, scoops, etc. Children have wonderful energy and curiosity, but a few months' familiarity with these household objects dulls their desire, and the work partakes of the nature of a task or drudgery. Of course children will take to any kind of tools, like ducks to water, to escape from the schoolroom routine, even if it is a "whittling class." But consider what they might have been doing in the way of real manual training and invention, and in the creation of beauty.

The utilitarian idea is a valuable one, but it can readily be used to dwarf and stultify the child's energies. We can of course say that the child learns by "doing," but a great deal depends upon the character of its deeds. No feeble amateur with "knife work," no plain mechanic or carpenter with hammer and chisel, should dare to dally with the works and mental mechanism of a child. As well let an idiot repair a watch with a stick. The child, if left to its own impulse, will assuredly do something and find out something.

Utilitarian idea overdone

Again, though sloyd may be good for Sweden, where the nights are long, the children require occupation, and the homes need the useful models (this being the original reason for sloyd, as an authority admits*), this country has very different needs for its youth.

Sloyd is selected as an example of the work that is not true manual training, or the best kind of elementary work in

* "Sloyd," Larson, Boston, 1893.

PLATE THREE

Work in Clay Modeling, Public School of Industrial Art

manual training, because it is considered in so many quarters to be superior. Sloyd is selected for criticism because it has been so thoroughly tried, and with many advantages in several cities, no expense having been spared and all possible facilities having been offered for its easy introduction. I consider sloyd perhaps the best of all the amateur woodworking systems, though I dispute the claim that there is any real drawing in it, unless mechanical draughting is considered to be drawing. It has been graded to fit children from the age of nine to fifteen years —six years of the most vital period of life. I have never seen a sloyd pupil or teacher who really had the elementary manual training required of some of our little children, as described in this book.

Sloyd selected for criticism

Sloyd not real manual training

It seems as though the chief idea in sloyd was to see how many different tools could be used and how many operations could be devised, little thought being given to the absolute needs of the eye, the hand and the mind as fundamental tools. "It includes seventy-two exercises with forty-five tools, in eight kinds of wood, and is now employed experimentally in several schools in Boston."* In line with paper cutting and folding, sloyd is occupation or "busy work," but is very slightly educational. Ten courses of sloyd work will not give the pupil the automatic facility desired, or even fundamental co-ordination of the motor centers of the hands. Throughout the entire course, instruments of precision,—the rule, the compass, the try-square, the gauge,—are used constantly. Therefore, the eye and the mind never get the unconscious automatic power of grasping magnitudes and proportions so essential in elementary training during the period of growth.

Automatic dexterity desired

Is it not a mistake, then, to think that facility in any one narrow mechanical direction is proper manual-training education? Should not one look with suspicion upon operations, such as paper cutting, stick laying, whittling, sloyd, etc., which

* "Sloyd," Larson, Boston, 1893.

produce such little results and consume so much precious time, and endeavor to find operations that will give fundamental skill that is valuable and that can be used in all occupations or trades?

The graded courses and exercises in some other kinds of woodwork and drawing, extending over two or three years, with all exercises thought out, mapped out and charted beforehand, limit the pupils' capacity for doing original work, designing or creative work, besides consuming the energy at the nascent period, the period of growth, that should be given to right manual training, which if not given at this period makes good results impossible at a later period. It is like waiting for the hand to become fully grown before undertaking violin playing or piano playing, or some other operation requiring skill, instead of allowing the hand to grow into the positions so much to be desired by skillful performers and workers, with the added penalty of the physical impossibility of getting into these positions after a certain time has elapsed. The same is also true with regard to the mental states; after a certain time has elapsed it is as impossible for the mind to invent, to design, to create spontaneously and automatically, as it is for the fingers or limbs to move skillfully, automatically and spontaneously.

Some exercises consume energy and inspiration

Of course I do not speak against proper woodworking operations as described in this book,—joinery, cabinet-making and pattern-making. After fundamental manual training skill has been acquired, these special trade operations are fit and proper in their right place, just as mechanical draughting, machine drawing, architectural drawing, are right and proper, after training in fundamental drawing. But it is wrong to select a few operations from any of these processes and give them to young children as proper elementary training.

Proper wood working operations

In many places drawing and manual training are separate and disassociated, courses of one being given separate and distinct from the other. In some cases the absurdity of this is shown by graded work for each, as though they were entirely different studies and not related. It is as though drawing were

Manual training a mode of thought expression

not a mode of thought expression, a means whereby ideas of the form and shape of things are recorded, and as if manual training were not a mode of thought expression in making and recording these forms and ideas by the hands.

The catalogue of some schools will usually show under the head of manual training, for boys—wood turning, pattern making, foundry molding, forging, machine work and bench work in wood, mechanical drawing, draughting and designing; for girls—sewing, dressmaking, millinery and cooking. These are occupations or trades that are good in themselves, but are limited in their capacity to train hand and eye to correctly carry out the dictates of the mind. 6674

Ideas the basis of originality

Still more do the trade processes mentioned fail to develop the formation of thought structure by the working out of original ideas, which is the basis of true originality. Right methods of manual training, on the other hand, do bring about this union of thought and action, whereby the pupil is enabled to *think* of the right thing, at the right time, in the right place, and in the right way, and then to *do* it.

Art in handicraft very rare

I must not be understood here to speak against trades. I am in favor of every person having a pursuit and occupation, but I speak against the idea that possession of a trade process, or several trade processes, necessarily means true hand skill and right manual training, the power to make the hand obey the mind. The lack of this power explains the lack of real skill among so many workmen. The artist artisan is the exception, whereas he should be the rule. Art in handicraft is even more rare than handicraft itself. The methods laid down in this book, properly taught, supply the primary training that will give the skill, the hand facility, the co-ordination of hand, eye and brain, without which true handicraft can rarely be attained, even by many years of application.

But the youth who has had this true manual training during his elementary schooling has already acquired more real skill of hand and eye than the average apprentice working during the like period at trade processes only, while the manual

trained youth is infinitely better off as regards mental development and character building. The manual trained youth is wonderfully fitted to acquire dexterity in trade processes. He assimilates them unconsciously, because his hand is already so thoroughly skilled. He will learn a trade and become a better workman in it in a few months than the ordinary apprentice would do in several years.

Real manual training better than apprenticeship

"What is manual training?" To some it means an exercise for muscles, like gymnastics, and to others a process of making boys merely handy; others think it a way of teaching trades to children, and nearly all confound it with mechanical training and suppose a drill is necessary in sawing and planing, chipping, filing, wood-turning, plumbing, etc., very few disassociating it from the use of machinery and from slow, tedious trade processes, or dream that it has anything to do with women and girls.

Mechanical training not hand training

Real manual training for the education of individuals cannot be obtained by mechanical pursuits similar to carpentry, plumbing, chipping, filing, etc. Real manual training is not a matter of simply doing different things; it is the intelligent selection of modes from the many operations and pursuits most suited to produce the effect desired. Swinging dumb-bells or pushing a plane or saw produces muscles, but does not require the constant use of the intellect; the thinking powers are not increased in ratio. There are many exercises, then, more fit for our purpose. We must select for manual training purposes, work and methods that in addition to giving muscular activity, will exercise the peripheral nerves as tools of the senses.

What real manual training is

It includes all processes that train the muscles and the mind to work in harmony. In some of its applications it gives skill in planing boards and shaping iron; but just as legitimately does it make the hand cunning to dissect a nerve, to engrave an etching or to finger a violin. And as no school of manual training is obliged to teach anatomy, engraving and music, so no school of the kind must necessarily teach joinery or chipping and filing. Those who believe that such processes are inseparable from the

Muscle and mind must work together

use of saws and hammers have not looked all around the subject.

[redacted]

The distinction between right manual training and trade processes is therefore clear. The one precedes the other, just as reading, writing and arithmetic precede accomplishments in the law or the ministry. Right here is a special field for true manual training that is bound to widen. The old plan of teaching the trades has been found wanting, in that it consumes much time and yet turns out workmen poor in craftsmanship and equally deficient in purpose. The new idea is to teach the trades in trade schools, or technical institutions, where the

Hand skill should precede trade training

youth is carefully instructed in technical processes by experts. These trade schools are destined to increase in number and efficiency, as have the schools of law, medicine and theology. The youth who has had a proper course in manual training will acquire skill in the mechanical movements incident to any special trade in a fraction of the time that it requires for the novice who is untrained in facility of hand and eye. And this is true, whether the trade be taught in a technical school, or acquired by haphazard in an ordinary apprenticeship.

What are drawing and manual training

What are drawing and manual training when properly taught?

They are modes of getting ideas first hand and giving ideas first hand.

They bring about the union of thought and action which is so essential to the well-being of the individual.

They are physiologically and psychologically sound.

They are methods that train the powers of the instincts as they develop, that rightly educate these powers during their formative period, when most responsive to good or bad influence. They unify and simplify the courses of study.

They fit for the real work of life, for this training has a practical application in almost every vocation.

Drawing and manual training, properly taught, do away with tradition and the traditional errors in education. They are modes of thought expression, just as speech and writing are

modes of thought expression. Drawing is an universal tongue. It compels observation, reflection, perception and conception. It opens the mental eye, the eye of the understanding, that looks all around, up and down. It enables one to understand the message that is printed in every natural, normal thing, that is stamped with everlasting lines on each side of every leaf and blade of grass, that is twisted into the architecture of every shell, and that shines in the hues of every crystal—a message of beauty, of proportion, of grace and of fitness. Drawing makes mind. Drawing makes mind

Drawing and manual training properly taught, as Hailman says, "render lucid the latent spiritualities of matter." They "enhance the utilities of life by clothing them with beauty," give power to do, power to enjoy.

One objection that has rightly been made to the introduction of the so-called manual training methods, especially by committees and superintendents, has been the great expense of the plant and equipments necessary. In large cities like Philadelphia, only 95 cents per annum per pupil is now spent for all supplies in general school work—books, pencils, paper, pens, and sewing materials. In the light of this fact, it seems absurd to pay for benches, sets of tools, etc., for so-called manual training, sums ranging from \$15 to \$30 per pupil, for a plant that can be used by a very limited number; the sloyd bench and tools alone costing sometimes as much as \$30. Objections on account of cost

The cost of the plant for the manual training herein set forth is very small. It will be noticed that but few and very inexpensive tools are specified for the work in drawing, modeling and carving. In the Public School of Industrial Art, forty sets of carving tools, costing less than \$5 each, and a few simple tools for use in modeling, with some models of natural and art forms, suffice for 1000 pupils. The supplies required are equally inexpensive, consisting mainly of chalk, pencils, ink and brushes, cheap paper, some clay, etc., costing very little per year per capita. This slight expenditure only is required for four Economy of right method

different departments—drawing, designing, clay modeling and carving, not one only, as in other systems.

Ease of application to large numbers

Another advantage of these methods is to be found in their ease of application to classes of large numbers, without large expense; in fact, if necessary, the work in drawing, the drill work, the ambidextrous work on blackboards, can all be done on slates and common manilla paper. A few sets of tools and appliances for modeling, and the clay, can be used in common by as many classes as can be brought in succession into the room. The same with the carving. Although this is not the best plan, it is inexpensive.

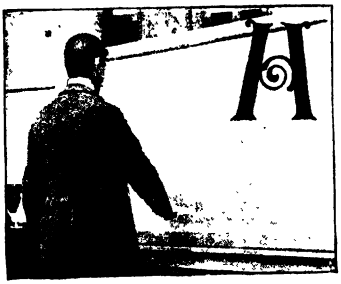
Because of the economy of plant and supplies, this method of manual training is within reach of the smallest or poorest schools as well as those in wealthy communities.

Cost of elaborate plants should be spent on teachers

The saving in equipment over improper methods may well be invested in more teachers and better teachers. It is as wrong to employ an underpaid and overworked teacher (the two usually go together) in manual training instruction as in other branches. The tendency in school work has been too much toward extravagance in equipment and parsimony toward instructors. Fine buildings and costly apparatus never compensate for poor teachers. It is the teacher's enthusiasm that must help to inspire the pupil; the teacher's intuition that must aid in discovering the pupil's individuality and help him to make the most of it; the teacher's human interest that must warm up a responsive interest in the pupil. These attributes of the teacher's personality can be supplied by neither books, apparatus nor buildings. The teacher has a mission to perform, he gives more of his very life to it than the worker in other vocations, and should be paid and esteemed accordingly.

CHAPTER V

Lack of Real Drawing—



HERE IT MAY BE FIT TO interject some of my experiences at the World's Fair at Chicago in 1893. For purposes of gaining experience, as well as of exhibiting our methods, we had a very large space in the educational department, adjoining the most important of the technical schools and colleges. In this space I purposely had several "traps," one of which was a blackboard twenty feet long. My purpose in having this blackboard was to test adults and children of all conditions as to their capacity in certain directions. These tests are tabulated and systematized, and I discovered several interesting facts.

Not more than four per cent. of the drawing teachers who were tested could draw,—I mean draw as a mode of expression, delineate what they thought. The rest depended on the model entirely. Amazement was expressed continually at their even being requested to draw something simply without a model. I found only eight cases, out of several hundred, that had facility of hand,—I mean the kind of elementary facility required in this book from children. The tests were put to the teachers of a great many leading institutions, and to normal art school,

Lack of real power of drawing

college and technical graduates. Almost invariably there was an absence of proficiency in organic drawing, and, considering the amount of time they had given to the work, their imitative drawing was feeble beyond the power of words to express.

Lack of art training in common schools

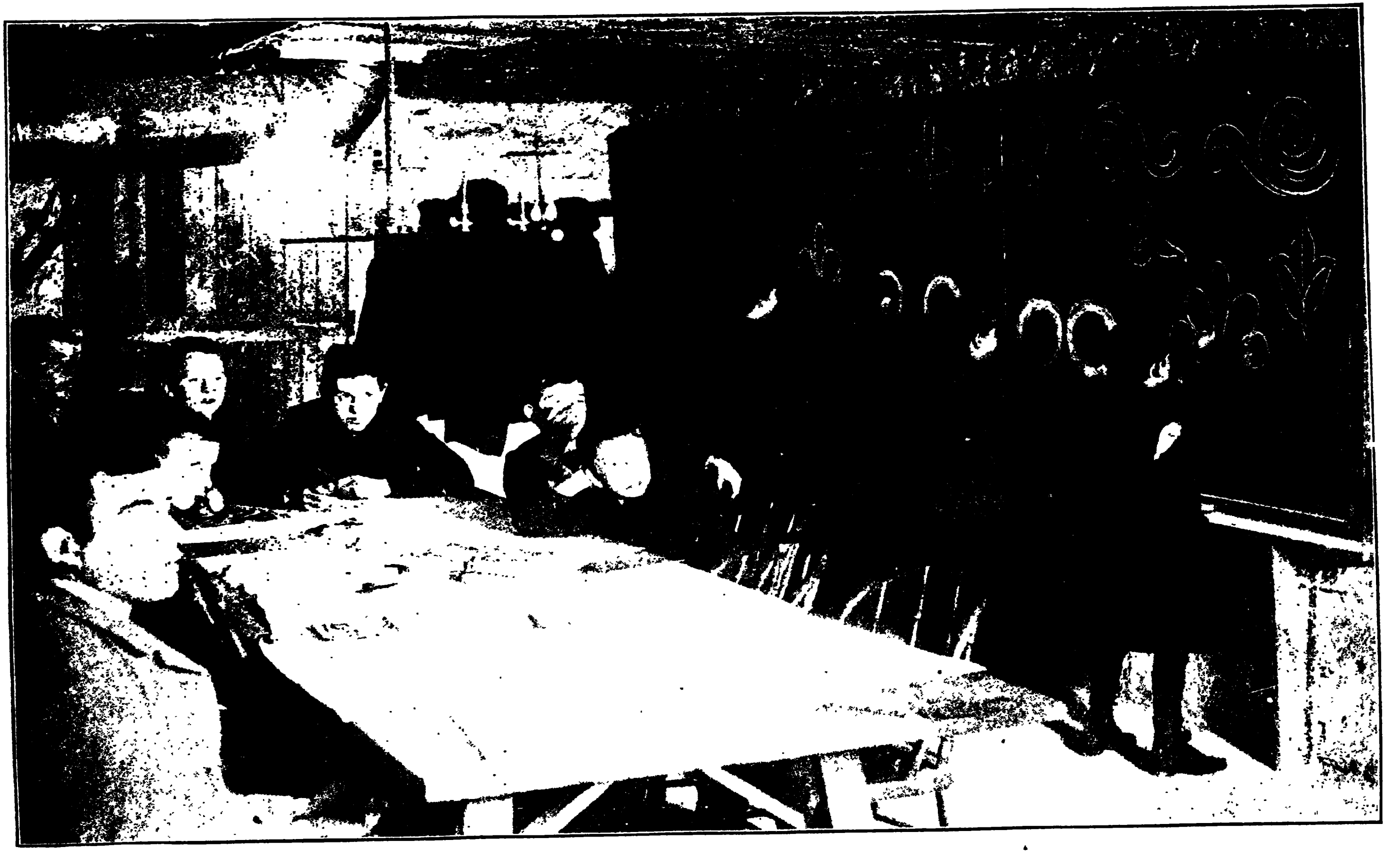
Approaching this question from the art side, the unprejudiced observer who has any knowledge of art cannot fail to realize and be impressed with the lack of any tendency toward art training in most of the common schools of the country. There is a gulf between the teachers and the idea that has never been crossed, and the poverty of ideas on the part of teachers, intelligent in other respects, is amazing. It seems as if nothing right was being done, and that ignorance ruled in these matters. This is not owing to any fault of the teachers.

False systems formulated by publishing firms

I am inclined to lay more blame upon the inventors of certain systems, who are never artists, who are backed by publishing firms, and whose chief idea is to sell books and materials. Some of the schemes are so artificial as to require different sets of materials, copy books and plant for different grades, and constructions and technical terms have been so loaded upon these things that it requires a wise teacher and special training in the methods of the books alone to be able to understand their object and their purpose. This, fortunately, very few teachers endeavor to do. Some of the systems claim that their books and materials do away with the necessity of the teachers being able to draw, and that instruction can be imparted in an easy and ready fashion by means of these equipments. And so the game goes on at the expense of the children.

Another of my chief reasons for writing this book is because I feel I can be of service to a large proportion of the community represented by the superintendents of schools, also members of school committees, usually men and women of affairs, and others interested in the well-being of the schools in various towns and cities of the Union. The spirit of the age is compelling many, in spite of dislike, to advocate various kinds of manual training in the schools, and through lack of

PLATE FOUR



Blackboard Work in a Night School

knowledge (and it is a little unreasonable to expect superintendents and others to be experts on these subjects) many experiments and methods of work are being tried that are fundamentally wrong, as will be proved by experience. For instance, various kinds of carpenter work, knife work, sloyd methods, paper cutting and paper folding are being incorporated at much expense in schools as manual training.

Sewing and cooking not real manual training

I do not object to sewing and cooking. I consider them very important things. But for our purpose, they are not methods of artistic or manual training. I consider cooking one of the most important of all the arts, and I must be ranked as an advocate of both cooking and sewing, in the proper place. The proper place, however, is not that gained by usurping the manual training idea in education, because every thinking person will realize that cooking does not give exceptional dexterity and skill of hand in the arts, nor does sewing. If we must have special experts to teach cooking, sewing, writing, drawing, music, should it not be necessary for us to have experts to teach mathematics, history, geography, and the other studies? This seems to be the tendency, but it is not feasible in the schools. What is to prevent the ordinary teacher's having a certain amount of capacity in these directions? We certainly cannot call the teacher an educated person, or one able to teach, unless he or she has some ability in these directions.

Necessity of systematic training of the senses

In the beginning, nothing is more important than the necessity of making the various senses alert and bright by constant and systematic use. The perceptive faculties should be made accurate, the memory correct, the thinking and the willing powers strong and true by direct use on things. These capacities or faculties diminish very rapidly for lack of use, and at certain stages the organism refuses to work, and the best impressions possible are dull, fleeting and feeble, not being distinct enough to form even nebulous ideas. Mental structure, thought fabric, must be made by children coming in contact, first hand, with things, receiving and assimilating all the possible sense impressions, and making all the possible movements

and reactions. No mere memorizing of printed words, no juggling with figures, no listening to a series of disconnected facts, will take the place of organic impressions permanently registered and systematized.

This can best be done by means of the various modes of expression, when the hand, the eye and the mind are continuously and pleasurably storing up facts and making the required movements. The most perfect lessons can be received from the most common and the simplest things. Hence, a good teacher will make use of common and simple things. In the elementary stages of education, drawing and modeling, properly taught from the most interesting and simple forms, train the perceptive faculties of children more than any other study, strengthen the memory, judgment and imagination, and arouse the instinctive investigation so powerful in all children. The idle curiosity of untrained children is the starting point for the good teacher. This curiosity must be cherished, intensified and stimulated until the habit of complete and willing attention is formed, the teacher gradually increasing the power of attentive application of the pupil until the stage of genuine study and hard work with the eye, hand and intelligence is obtained as a natural growth.

Drawing trains the perceptive faculties

Aristotle has said, "The hand is the instrument of instruments and the mind is the form of forms." Surely we must give some real and fundamental training to the hand. This hand skill is to be acquired by all, not because they are to work, but because they cannot afford to be without a training that makes brain co-ordinations form sense connections, and therefore aids or makes intelligence, reason, imagination and judgment in the shortest way. This hand skill is requisite, not necessarily to enable its possessors to become artists or artisans —though possessing art skill and capacity through esthetics is essential to complete culture, and this is the side usually to be considered—beauty acted. By manual training methods the person becomes able to deal and do with things if necessary, to be always ready to enjoy and appreciate nature, and grows self-reliant because confident of power.

Hand skill makes intelligence

I should like to utter a protest against the vain experiments of certain psychologists who are at present misleading teachers in wrong methods of child study; who are simply dallying with things that are not essential. A great loss of energy is the result. For this they have been performing trifling experiments on troops of children, efforts that have no product. Why not study the acts of children for some useful and educational purpose, for some method that will tend to conserve their energy and health? I think that half the energy given to some of these things, spent on investigating the capacity of expression through the hand, would soon lead to golden fruit. The possibilities and potentialities in this direction are unlimited. Let this field be worked.

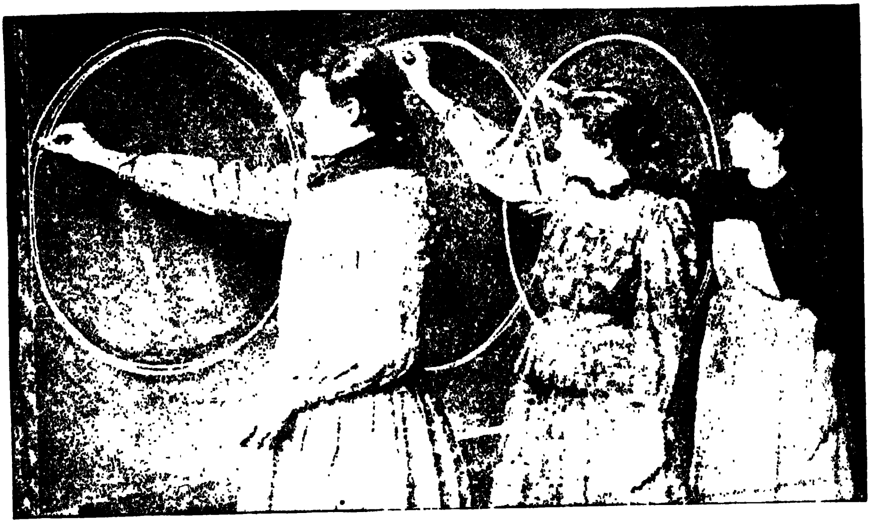
In all my experience I have never yet found a teacher educated by book methods able to draw. This seems an incredible statement, yet from my point of view it is correct. By drawing I mean thought expression and power to express ideas of all forms on surfaces and in things; not the feeble imitations of certain methods, of conventional forms, with labored application, bit by bit, dot by dot, but to have organically the power at once to delineate balance, proportion, grace, beauty, fitness. By drawing I mean the vital union of thought and action that gives definite expression to individual thought through the hand, the power to reproduce mental images just as we express them by speech, after assimilating certain sense impressions; creating and designing nature anew.

I have actually had pupils come to me who have recently wasted money and energy by trying to learn drawing by correspondence through the mails. Perhaps very soon some people will try to teach music, singing, for instance, the same way.

The methods I advocate are no longer new. Ambidexterity, psycho-physical co-ordinations, memory work, rotation of classes and other features peculiar to our course, have received the test of time and application to large numbers.

Could any sane person walk around the ten acres of school exhibits a few years ago at Chicago, at the World's Fair, and be

Illustration 20



The Freehand Circle
These teachers are practising large free-hand movements in order to acquire facility

satisfied with the work going on under the name of art, of drawing, of manual training? Could anyone for a moment think that it represented the work of individual child life, of growing organisms, each one alive? Did it not all seem fashioned from the same mean lack of thought exhibited by some plan or system maker? Did it not show, in its various similarity, an endless repetition of the same things—the hand of trade? Did it not show, from its very constant and feeble ringing of the changes on cubes, blocks, cones, prisms, definitions,—the iteration of terms, construction, representation and decoration,—shallow minds wading in a morass of second-hand thoughts, words and phrases; able to talk, parrot fashion, but not able to do; able to say, but not to feel; able to preach, but not to act? In short, to dogmatize. That is, literally, to assert with undue confidence and to advance with arrogance. Did it not show, from end to end, the commercial element, the spirit of greed for money at the expense of mind? There were

Insufficiency of old method

only a few green oases in the desert, represented by some schools, where I actually found real autumn leaves and fruit forms drawn and colored by the pupils. Verily, the sacrifice was awful. Hundreds of miles of paper with "soft gray lines" represented thousands of minds distorted and drawn out of shape.

Teachers must be able to draw

I state without fear of contradiction that no one who is unable to draw should attempt to teach drawing, yet without one exception I have found the presenters and representers of all commercial systems unable to draw, and, what is far more saddening, none of their pupils could.

Supervisors should be able to draw

I protest once more against anyone's teaching drawing who is unable to draw. It seems that many of the supervisors and so-called experts on this subject throughout the country, with very few exceptions, are unable to draw. Most of them have worked a few years at some art school, chiefly at imitative work. They have made a few light-and-shade drawings and have studied perhaps a little perspective. They have painted a few flowers and made a few carpet designs. And then they start out on their career with some "system." The children are expected to perform a series of graded exercises, usually of "geometric forms" and "objects based upon geometric forms." They are compelled to work from type forms until they are sick of them, and then they are expected to see resemblance in the most diverse objects to these type forms.

Misuse of type forms

It seems to me that this is fundamentally wrong. We should teach the children to look for dissimilarities. We should make their observation acute to notice how different and unlike things are to each other. It is very stupid to me to make children labor at a cone, for instance, and then give them the wrong idea that a lamp chimney and a carrot, ink bottle, etc., are based on this cone, because there is a very slight resemblance. To me they never look alike, and I have never yet found a bright child who will begin to associate them in the mind voluntarily. Remember, I believe in type forms and in geometric forms in the right place, but they are abstractions. Children should have nothing to do with abstractions in the beginning. Before they

are given any idea of the type forms, their minds should be stored with a series of the natural forms, from which we receive the idea of the type. When a child has become familiar with apples and marbles, soap bubbles and other round things, then the abstract idea of the sphere may be grasped.

It may seem a little unfair that I should attack the methods of the so-called drawing teachers in the schools, but what are we to do when we find the great lights, or authorities, so-called, giving utterance to statements like the following. In the report of the proceedings of the National Educational Association for 1896, on Page 693, will be found such a statement as this, not by an ordinary teacher or a teacher of drawing, but by the superintendent of drawing for a whole city—a teacher of teachers: "There is such a thing as a child having too much candy, and there is such a thing as a child having too much beauty. He may become so accustomed to it that he will not appreciate it." I leave the above to speak for itself.

Foolish statements by so-called teachers

Again, we find in the same book, on Page 700, not signed by one person only, but by half a dozen, including a college president, a director of one of the chief institutions in the country and several other very prominent people, the following: "The use of colored papers is the best means now available of presenting and applying standards or ideals of color, scales of these standards, and combinations of different scales." I protest against stained papers of any kind. I have never yet seen natural colors on the papers used for this purpose in schools. They are artificial and crude in all respects. What is the matter with the real colors of nature, as exhibited in flowers, shells, stones, butterflies, insects, feathers, birds, etc?

Again, the same book, Page 698: "Models of the pure geometric types of form, which underlie all the manifold variety of form in both nature and art, should be studied in connection with these selected objects in order that pupils may learn to see how the type forms are the basis of all other forms. Having in mind accurate and distinct concepts of the types, the pupil can more easily understand their numberless modifications.

Having a clear understanding of their modifications, he can best express his ideas of them by drawing." I have personally shown this complex sentence to many artists. I have not heard one agree with it. I have yet to know any artist of importance who was ever educated in this way.

Absurdities of commercial systems

Another sentence is as follows: "The exercises should also be distinctly classified so as to cover the three great divisions of all art work, namely: Representation, or the appearance of form, decoration or the ornamentation of form, and construction or the facts of form." This sentence, perhaps, will be the key to a great many of the absurdities indicated above. It simply shows to one who has studied the whole question carefully, and without prejudice, that none of these so-called authorities can themselves draw, or have the beginning of an idea about drawing, but that they have a very complete idea of an artificial system which has been classified and systematized until drawing and art have absolutely disappeared from it. I venture to assert that not one of them ever painted a picture or modeled a statue.

Artificial forms, stained papers, etc., useless

How absurd it is then that they should stand up as authorities on the subject and mislead people. It has been done, however, for a purpose, and that purpose is to sell various materials,—series of books for each grade, series of artificial forms in wood *graded*, pencils for a variety of purposes, stained papers, geometric shapes, etc. This has gone on until even the cost of these things makes the work impossible in many schools and frightens the simple-minded by the seeming complexity and difficulty of a very simple subject. Indeed, drawing requires less plant and arrangements than any other branch in the school curriculum, because drawing can be done with only a piece of paper and pencil, or a slate and pencil, if necessary.

The art part vital

We must see that art comes into every step of the elementary or fundamental work, using the word in its fullest meaning —*ars, artis,*—"skill in joining and fitting," "the employment of means to accomplish some desired end," "human labor regulated by design." In every stage of the work the instrumentalities of the pupils should be set directly at work, the

hands, the eyes and the head. There should be no instruments of precision, no copy books to save labor or avoid skill. The art part of a great deal of work is the part that cannot be measured, weighed or marked,—it is the vital part. Science compels observation and reflection, but does not always result in action. Art compels observation, reflection and action, and makes them mutually dependent on each other. " Science is the knowing, art is the doing." It, therefore, makes vital and alive the connection that should exist between the inner thought and the outward action.

Art and manual training teachers should be examined

I pin my faith to the superintendents, if we are going to better the schools in this direction, not to the crank artists, art directors and supervisors. Superintendents are usually men of affairs, teachers who have been selected for fitness and merit, men who have been taught by experience. They will have to realize, however, that, just as there are many ways of teaching language, reading, geography and arithmetic, some good and some bad, so there are many methods that go by the name of art and of manual training and drawing. They will have to demand that their art directors, supervisors and teachers should be able to draw. I do not mean that they should simply take their word for it, or be satisfied with a portfolio of drawings of objects, casts, cubes, blocks, or a certificate of this or that normal art school or mill, but, being rational men, that they should see that the teacher can draw, knowing that drawing is a mode of thought expression, not simply a familiarity with certain graded steps of a traditional or dogmatical thoughtless plan. They should say: " Here is paper; express yourself; draw a leaf, a house, a cat, a scroll, anything." Performance should be the great test in our business, not words and assertions. I have actually known some teachers, when confronted in this way, to say: " Where is the model for me to copy?" Surely these are not teachers, but imitators, copyists

Critics may consider that the author has devoted too much attention to the decorative and conventional forms, to drill and designing. He considers, however, that in a book of this

character, written to help large numbers of workers in various directions, the industrial art features and their applications should be amplified especially. But this is not done at the expense of any real art study. It is really the elementary part of the truest kind of art work. The drawing from models and casts, and the other usual "fine art" studies, are lightly touched upon, because they are already well known. The aim has been, also, to consider as much as possible the large number of pupils who do not become artists, but who do require the skill and art knowledge essential for success in the various pursuits of life.

Drill essential in the elementary stages

Designing, Ambidextrous Work

CHAPTER VI

Right and Left Hand Work, Ambidextrous Work

THE RESULT OF THIS WORK HAS only to be seen for one to become impressed with its value as a medium for the education of the individual. The most skeptical are convinced by the perfect results produced, the simplicity of work, the almost instant balance and symmetry, and the visible development in the directions most to be desired in the education of the hand, the eye and the mind.

Improvement is also made in other directions. The co-ordinating of one set of muscles invariably influences the rest. The hands, the eyes and the mind are exercised to a much greater degree than is possible when using them only partially. Hence, a more symmetrical whole is produced. The pupils stand better, hold their heads more erect and level,—in a word, they have more understanding.

Sympathetic influence

If it can be done with the right hand, why do it with the left? some say. Why waste time that might be given to something else? These questions are natural, and at first seem right, but a little thought makes one realize that in many trades, especially the ones requiring skill of hand, both hands need to be

used, and the more skilled the left hand the better the workman. Again, some artists who first hear of our ambidextrous work sometimes think it absurd. They do not realize that we do not attempt to sketch or paint with the left hand, and that it is mainly for its physiological and educational value that we train it.

Reasons for ambidextrous work

The reason we do ambidextrous work is for the physical co-ordinations acquired. Biology teaches that the more the senses are co-ordinated to work in harmony in the individual, the better. If I work with the right hand, I use the left side of the brain; if I employ the left hand, I use the right side of the brain. In truth, I exercise some special region or center of the brain in every conscious movement I make, and in every change of movement I bring into play some other center. If, by performing any such action with energy and precision, I aid in the development of the accordant center, I am improving the cerebral organism, building for myself a better and more symmetrical mental fabric.

Not unreasonable

Does this seem unreasonable? We use both feet, both eyes, both ears. I am firmly convinced that the better and firmer the union of each hand with its proper hemisphere of the brain, and the more facility we have of working each together, and also independently, the better the brain and mind and the better the thought, the reason and the imagination will be. The results of my method have fully demonstrated this fact, as the teachings of modern science, and especially of psychology, have fully established the truth of this contention.*

* "Every impression of sense upon the brain, every current of molecular activity from one to another part of the brain, every cerebral reaction which passes into muscular movement, leaves behind it some modification of the nerve elements concerned in its function, some after-effect, or, so to speak, memory of itself in them which renders its reproduction an easier matter, the more easy the more often it has been repeated, and makes it impossible to say that, however trivial, it shall not under some circumstances recur. Let the excitation take place in one of two nerve cells lying side by side, and between which there was not any original specific difference; there will be ever afterward a difference between them. This physiological process, whatever be its nature, is the physical basis of memory, and it is the foundation of the development of all our mental functions."—[Maudsley, Physiology of the Mind, page 27.

Drawing and Painting Birds from Life

The appreciation of color and the fidelity with which the grace of natural forms are reproduced by children who have had the elementary manual training

I am convinced that in proper manual training movements—exercises that make a firm, well knit union between the hand and the brain, making the hand (and each hand) obey the mind independently, we are producing new mental conditions, or physical structure in the brain. The brain has growth in the beginning for a certain period, and arrives at a certain size during youth. Afterward it increases in complexity and structure. All recent studies of the cerebrum point to the fact that our intelligence is associated with a union of brain cells one with another, and the more experience we gain through the various senses, the greater will be the structural union and complexity of the brain cells.

Mind building

It seems wrong to see children compelled continually to memorize and to draw on the reason, the fancy and the imagination, before they have well developed centers or brain cells with which to think, reason and ideate. I know for a fact that the energy of many children is consumed and exhausted by the use of abstract thought work too early in life, instead of being conserved by proper training.

Abstract work wrong

I claim better results from the right hand, when the left is worked also, than from the right hand working alone, in the same space of time, in almost any kind of hand work. In 240 trades or crafts the workman employs both hands quite freely, and in certain occupations, like carving, engraving, modeling and chasing, the left hand works as much as the right. Muscular co-ordinations and facility with the left hand as well as the right are therefore very important and of large practical application, apart from the physiological and mental value of ambidexterity.

Indeed, the old education neglected *both* hands, not the right hand only. Yet who shall now say that the education of these marvellous portions of the anatomy should be longer neglected? Truly says Sir Charles Bell, in "The Hand" (Page 134):

Old methods of education neglect both hands

"The human hand is so wonderfully formed, so beautifully shaped, it has so fine a sensibility; that sensibility governs its

motions so correctly, every effort of the will is answered so instantaneously, as if the hand itself were the seat of that will. Its actions are so powerful, so free and yet so delicate, as if it possessed a quality of instinct in itself, that there is no thought of its complexity as an instrument or of the relations which make it subservient to the mind. We use it as we draw our breath, unconsciously, and have lost all recollection of the feeble efforts whereby it has been perfected."

Surely, then, the new education must not make the mistake of training but one hand—one only of these two instruments of power and action.

Meissonier also said: "It would be a great advantage to be ambidextrous,—children ought to be taught this habit."

Illustration 25

Freehand Original Designs, Public School, Germantown

All the children in the room draw at intervals on the blackboard making original designs. The pupils at the benches work on paper from objects and in color, sometimes at designing, sometimes at natural forms.

CHAPTER VII

Drawing Correlated with Other Studies

Modeling Fruit Forms from Nature

Correlate the drawing with other school work

HE LESSONS IN THE SUCceeding books of this work have been evolved from the results of years of experience in working by a number of different methods. They have been arrived at after much experiment, on account of their suitability for the young and the old, and the fact that very little plant is required. From the very beginning, the object has been to co-ordinate or correlate the drawing with all the other school work. One of the greatest troubles with drawing by the old method is that it seems to be something entirely apart from the other studies, a mere accomplishment, something for the select few, the ones who display a certain amount of talent. This is wrong. Drawing and manual training are especially suited for backward and dull pupils; they are the very ones who most need its training.

Bad use of art work in schools

Drawing can very readily be made one of the most vital of studies, one of the most important. It is the study on which half the drudgery and tiresome work of the school can be placed.

It is the study that makes pleasing and interesting to themselves the work of the pupils. Drawing and manual training, above all other work studies, will enable the child to work out its own salvation, in the fact that they form a disposition to action and allow the child to make the energetic movements that are so good and proper for its well-being.

Drawing in the past, to many teachers and children, has consisted of mere imitative work from a few type forms,—meaningless blocks. It has not been made a vital and connected part of their other studies. If children are to know things, to gain knowledge (and their coming to school is for this purpose), I know of nothing that will take the place of the right kind of instruction in drawing, as it compels their attention to things, if properly presented.

Compels love of nature

Take, for instance, a rural school, where the children get a little reading, writing and arithmetic, in homeopathic doses, and very little of anything else. See what glorious possibilities and potentialities there are here, if the teacher has any idea of drawing as it should be taught. Right at the door is the whole field of nature—plants, flowers, insects, animals, stones, fruits, vegetables, can be procured without any trouble. The children are delighted to bring almost anything in the way of models of this kind. If they are near the seashore, the boys can get endless forms of life in the way of seaweeds, shells, crabs, fish, etc. If in the mountains, the same can be done with different kinds of plants, weeds, stones, birds, fish, insects, etc. These forms can be drawn, and the reading, writing, arithmetic, spelling, composition, punctuation, and other studies hung on as incidentals. The children will be fascinated and inspired at first hand. They will take an added interest in their work, especially when the doors of their minds are opened and the things of which they see so much and know so little are transformed for them.

The beginning of wisdom

Farmers' children and others should know all about the birds, bugs, caterpillars, flies, spiders, weeds, plants, the flowers and common growths of their environment, and thus have matter

that will be of value and an aid to them in their future life. This is very much better than cramming them with disconnected facts of history of far-off countries, incidents in the lives of kings and statesmen, that are not of much value. Of course the young should become as completely educated as possible, but if they are to have one thing or the other, let them get, first of all, direct knowledge of their own environment.

Knowledge of things of first importance in education

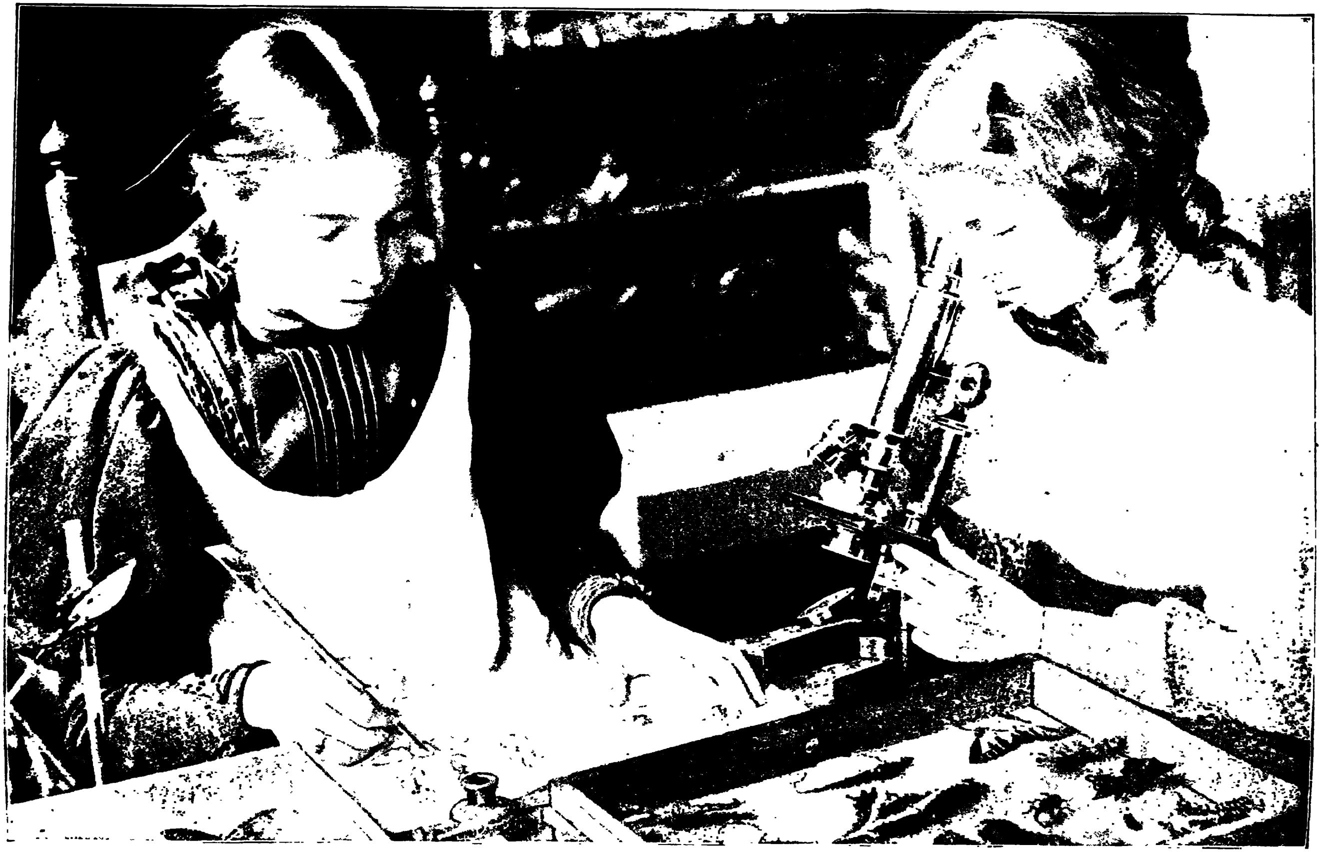
There is no reason, even in city schools, why similar work should not be done; though the country child has far greater advantages in the way of studying natural forms, the city child has many compensating advantages. Nearly all children can get from their homes and from their friends any of the simple common things in the way of leaves, plants, shells, animals, etc., that are the fundamentals of study, and with which we should first fill the mind of the child before we attempt to give the higher thought studies.

I can see already this change coming in many places, although so far it is mostly in the way of the introduction of things that have utilitarian value alone,—trades similar to carpenter work, cooking and sewing, which to me simply consume the valuable time of the children without educating them. I think the time is near at hand when the true idea will be received. Institutions like the Drexel Institute, the Armour Institute, the Pratt Institute, are simply, in my mind, protests against the old methods of education. They are schools where the pupils *learn by doing*, and though in some cases, trades are taught instead of real education being given, I think the latter will be the next step.

Good pictures improve taste

No one can see how newspapers and books are changing, with their endless pictures and illustrations; no one can see the improvements and means of getting better pictures in all directions, without realizing that this must have a great influence on the education of those to come. The same is true with regard to smooth roads, electric lights, the bicycle, etc., all influences that are tending to make life easier and better. Some of the papers and magazines to-day are real works of art. Continually they

PLATE SEVEN



 Correlation of Drawing with Elementary Natural Sciences—Entomology

are pouring out on the multitude streams of visual information that must have an influence. The school is bound to keep in line with these things. Better methods and better text-books and appliances must be used. The old methods *have* to change, and the teachers, too.

Futility of present methods

Appliances in the schoolroom that have been used for 20 years are still being used the wrong way, and at the wrong time, such as copy books and drawing models, imitations of copies, etc. In some schools, systems of geometric forms (wooden ones) are used during the entire eight years of the school life of the child by teachers who have never been able to draw from the beginning.

Can anyone fail to realize how tired and weary the children must become of these things, and especially when they do not find any vital connection in them with their work? We cannot expect the children to do this when we find the teachers unable. All artists know how unreasonable it is to expect a product in drawing from children if they receive only a few homeopathic doses of "construction," "representation" and "decoration" a few minutes a week. The artist knows how many hours of study and actual delineation must be given before even an ordinary amount of capacity is achieved.

Drawing a mode of thought expression

The whole subject, however, assumes a very different aspect when drawing is used as one of the chief instruments of impressing the organism through all its various sense channels, and is also used as one of the chief instruments of imparting knowledge in all its various branches, being a mode of thought expression, just as speech and writing are modes of thought expression.

Meissonier

Meissonier thought drawing one of the bases of primary education, and said: "To what heights might their intelligences be trained by simply teaching them to see. I would have drawing made the basis of education in all schools. It is the only language that can express all things. An outline, even if ill shaped, conveys a more exact idea of a thing than the most harmonious sentences in the world. Drawing is absolute truth, and the language of truth should be taught everywhere."

I like my pupils and teachers to understand the distinction there is between sketching from nature and designing. In the one case we put down *facts,* and in the other, *ideas.* There is a tendency for many students to sketch only from nature. We get our ideas by thinking as well. More time should be given, then, to dwelling on our impressions and to systematic mental reproduction, and to giving expression to these ideas constantly by designing and creative work.* Growth of ideas

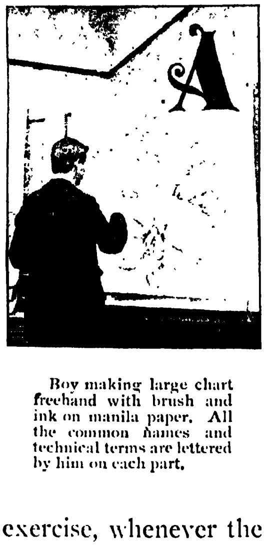
To get good art work we must have good ideas, and they must be tangible and concrete ideas that we can instantly revive at will—that will recur automatically to the mind when needed. We can revive impressions of things, and we ought to be able to revive ideas in the mind. They must be placed there first. They must be firmly locked into the mental fabric by the systematic performance of deeds, not only once, but many times. The more experience I have the more I can embody in these ideas; facility of expression giving accuracy of perception. The more I know of history, countries, religions, governments, climates, habits, the more of value I can put in my work. Ideas must be locked into the mind

We must take in things, assimilate them and form ideas, and then we will have an outcome. The more we practice this, the more facility we will find ourselves obtaining. It is always possible to revive ideas in the mind and to make mental movements and co-ordinations. The more we do this, the more vital force we will have, the more deeply we will realize and appreciate things. We will begin to understand what inspiration means.

*"The idea in fact is organized as a separate mental existence in the cerebral convolutions, being for us when so organized to all intents and purposes the object, and may be aroused into independent activity. Every idea is thus representative, the abstract of many sensations, comprising implicitly more than it displays explicitly; in it the essential is embodied, the unessential suppressed or rejected; it is not the idea of any particular object or event, but the idea of every object or event of a particular kind; it is fundamentally a generalization or induction. We may justly say, then, that the ideational nerve centers idealize or ideate our sensory perceptions; the process of ideation, like other processes of organic evolution, being one of progressive differentiation and integration,—of discrimination of the unlike and assimilation of the like." [Maudsley, Physiology of Mind, Page 272.

CHAPTER VIII

Nature Studies—Right Methods



Boy making large chart freehand with brush and ink on manila paper. All the common names and technical terms are lettered by him on each part.

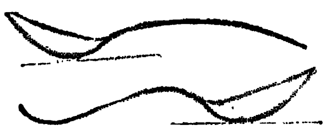
AN EDUCATIONAL AUTHORITY has stated: "The only way to teach nature study is with no course laid out, to bring in whatever may be handy and to set the pupils to looking at it. The pupils do the work. They see the thing and explain its structure and its meaning. The exercise should not be too long, not to exceed fifteen minutes at any time. And above all, the pupils should never look upon it as a recitation, and there should never be an examination. It should come as a rest exercise, whenever the pupils become restless. Ten minutes a day for one term of a short, sharp and spicy observation upon plants, for example, is worth more than a whole text-book of botany."

Looking at things not enough

I seriously doubt if this is the way. I question if they see the thing simply by "looking" at it. I question if in this way they can comprehend and explain its structure and its meaning. Many teachers have been following this method for years, and even adults in normal schools have been doing it for a series of years, but I fail to find much product or result. If simply looking at things will accomplish this, why is it that so few people,

suddenly asked whose head is on a two-cent stamp, can answer correctly? Are not stamps seen and handled often? I have tried this and other experiments on thousands of teachers for many years, and I know people do not learn or see by simply looking.

I find that even looking at and handling things all their lives will not enable some people to know the shape of the most familiar forms. Take a common spoon, for instance. Not one in fifty can give a sure answer as to how its handle curves, up or down. I do not mean that they should be able to make a drawing of it, but that they should be able to know actually how it bends.



Familiarity not knowledge

(See diagram.) From the concept that they have, or have had, of the spoon in their minds for perhaps years, not one among fifty will answer this correctly. Try it and see. The same is true of the shape of the most familiar tools. I can take people and prove that they do not begin to know the shape of their own most familiar hammer or saw handle.

Impressions must be repeated systematically

Capacity of this kind, accurate observation, can only be made automatic and useful by art methods, by practical esthetics, by organized impressions repeatedly and systematically performed until the mind takes in the desired percepts and can form the concepts.

Let study have permanent results.

But giving the sensation through one or two channels is simply useless. All experience teaches this; it is better to make a little knowledge vital and organic by the use of the conscious activities of the child. The child's motor centers must be trained by systematic exercise to respond instinctively to the stimulation of sight and touch, by a product that compels the exercise of skillful manipulation. It is this performance and systematic repetition that make the result permanent and valuable. It has actually been found that children have been made more stupid, dull, tired and restless by too much looking and handling, without using the spontaneous activities of several other motor senses.

I maintain that through art methods tangible results can be obtained that cause the child to take pains, that arouse its emotions to a point of love and sympathy on account of the trouble required to obtain some wished-for product. However trifling or poor this product is, the thing desired, and for which we must scheme, is to cause the child to re-create, as the work of its hands and brain and effort, the beauty, proportion, fitness, grace, etc., embodied in the forms studied. The child loves its product for the trouble it has caused.

We must appreciate the beauty of nature

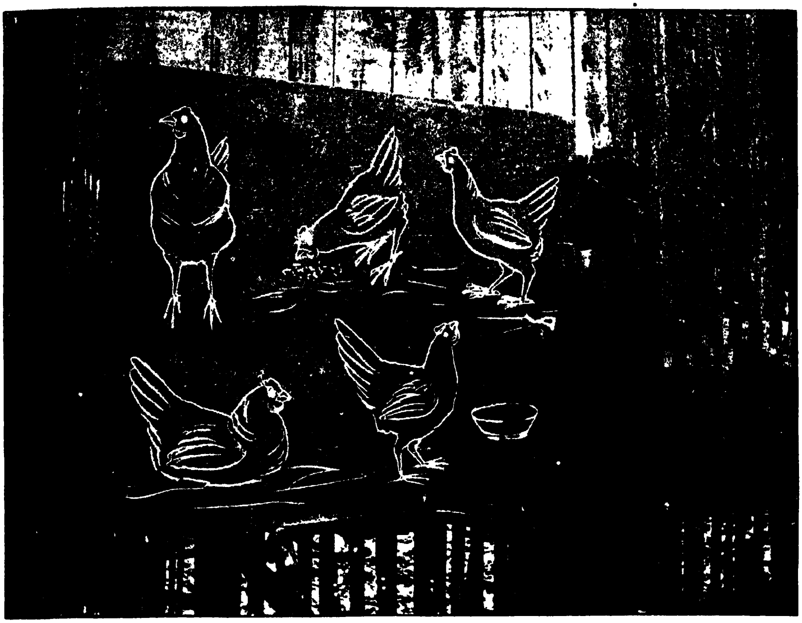
This is well illustrated by the habit most children have of saving and keeping as precious, trifling odds and ends that they have made, and that seem to have value to them because they have thought over them and worried over them. Experience teaches that formal collections of butterflies, pressed leaves, eggs, etc., are much less cherished, and usually find their way to the waste basket at some period, only a faint and feeble memory being retained of their forms, one that is entirely useless so far as regards a vital love of nature and the enabling one to enter into its beauties. We will not get love for nature unless we can appreciate the beauty of nature. This must be cultivated. No doubt there are some impressions, some faint traces of these things left in the adult organism, but not sufficient to arouse impulses to action or energetic moving emotion; not enough to inspire the motor reactions that end in deeds, though often enough to result in thinking and dreaming, and sometimes wishing.

Permanent organic impressions must be made

Yet, we can have a right return from nature study if we make the right use of our opportunities. All the rambles, walks and talks of ten teachers, all the looking and handling, are useless for the purpose of nature teaching, unless the impressions and information are made organic by the performance of work that compels systematic reaction of the motor centers to yield a product, this being the outward, concrete sign of the internal structure or thought fabric. So much of the one is shown by so much of the other.

There is something dense in the mind of the average child

Illustration 33



Drawing from Nature

that must be overcome by this systematic work. There is a mental inertia, if you will, or what might be called an infirmity of purpose, that has to be conquered before the union of thought and action can be made automatic and complete. Hence, mere looking at and handling objects will not give the best results desired in nature study. And, in proof of this, we find that most school work of this kind does not produce the expected results. But the methods pointed out in this work do produce the desired results in every case. The children get a loving recognition of things, and this arouses that energetic disposition to perform appropriate actions which is the natural state of the alert and active normal child.

It is dreadful to see children, as they grow up through the primary, secondary and grammar grades of a school into the high school, becoming more restless and more indifferent

to so many of the essentialities, when, if properly trained, they should have become more energetic, and disposed to carry on their work with the same energy they make use of in their play and amusement. I am afraid the element of "fun," with a number of other valuable fundamentals, is gradually crushed out by existing school methods.

Effect on health of improper methods

No truthful and thoughtful teacher can help but see also that many physical ills result from the present methods of training. Many children that are chubby and healthy and usually have fine color on entering school, are pale, narrow-chested, feeble, spectacled, cadaverous and pimple faced, when they have finished the school course. By damaging the body we, in a measure, damage the mind. After all, the body is the chief fabric. To this our best care should be given. The body, its movements, and its productions, are the outward fruits or signs of the "inner temple."

The idle curiosity excited by things must be cherished and nourished until it becomes attention. Inspiration from things means energy, — physical, mental and spiritual energy. We must assimilate and accumulate this energy. If God speaks at all (and who doubts it?), He speaks through His works. "There are tongues in trees, books in the running brook, sermons in stones, and good in everything" (Shakespeare). Ought we not to understand these tongues, read these books and understand these sermons? Ought we not to get the good from everything? We must, as Emerson says, "Bend to the persuasion flowing to us from every normal thing entreating us to be its tongue to the heart of man, to teach a besotted world how passing fair is wisdom."

Beauty and mystery of common things

We must make our children realize the divinity that is planted in things. There is a great desire and tendency in some quarters to lift the children above the commonplace. Should we not, rather, make them so familiar with things that even the mud and dirt and weeds will seem filled with beauty and mystery? Should we not open their mental eyes, the eye of the understanding, to the beauty and splendor of the smallest

created atom? Make them realize the force that is in every common thing, that holds together each flower and leaf and stone; make them realize that "matter and spirit are two sides of one fact."

Divine energy in matter

We are compelled to be with matter in this world. We cannot lift the children above the commonplace. Instead, we should thrust their heads well into it until they recognize their Mother Nature. There is an irresistible impulse, which is like the tug of gravity, that forces us sometimes against our will, to be close to facts and things. Let us be obedient and bend to the divine energy. Then we can gradually take in the idea, so beautifully expressed by Bishop Keene, that "matter is the stairway by which the soul mounts to God."

The desire for nature study is constantly increasing and is beginning to be appreciated among teachers. It is the method of studying nature that must now be improved. When we can learn, understand and make use of the lessons with which nature teems, the new education will indeed have made a great advance. This means much more than merely looking at things, though that is better than only reading about them. A recent catalogue of a summer school contained a picture of a professor of botany dissecting a plant while the class looked on. He was learning something and receiving an actual impression through the touch sense and the muscular sense, as well as through the vision, but the members of the class were getting only a slight visual and auditory impression of the plant and of its parts (for I presume the professor spoke) that they would soon forget. Now if each of the class had dissected the plant and in addition to the visual and auditory impression, had made an impression through the muscular and touch sense, and then had reinforced these impressions by making diagrams and drawings of the various parts, attaching their respective names to each part, first from the plant and then from memory, a more permanent impression would have been made. It is the performance of actions through a number of the modes of expression that calls forth powers of perception and conception and

Improved methods of study needed

expression, and makes so vivid an impression on the brain as never to be forgotten.

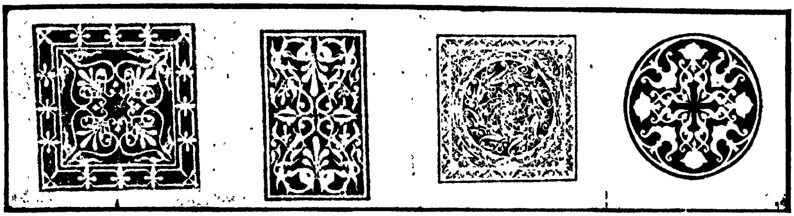
Universal use of new modes of expression

The power of imitation and suggestion, the ability to draw, to model and carve natural objects, is inherent and only needs to be properly trained to become almost as universal a mode of thought expression as verbal or written words. The succeeding books of this work afford a partial insight into the methods of developing and training these forms of expression.

A Touch of Nature

BOOK TWO

Manual-Training Drawing

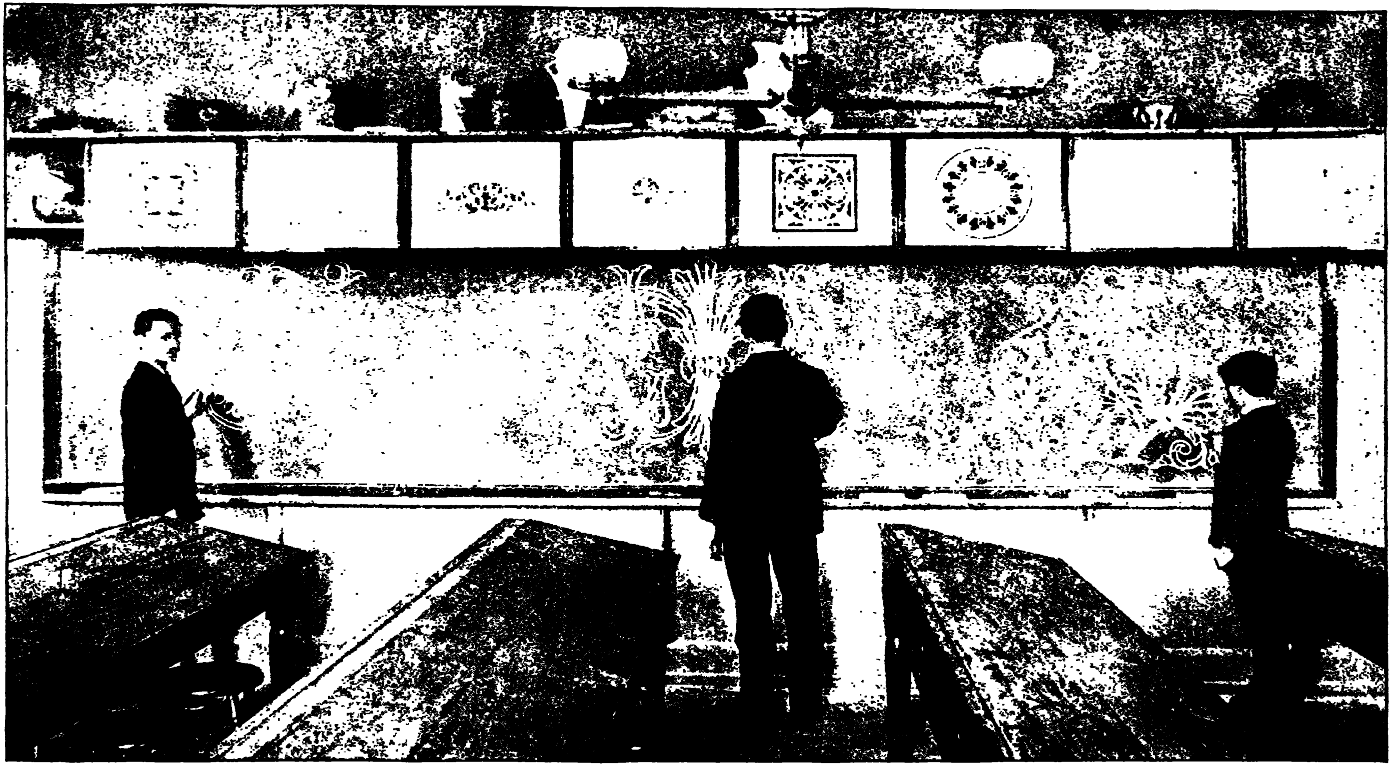


Original Designs by Grammar Grade Children

"The instantaneous judgments of the distance, the position, the size, the figure of objects, which accompany our visual sensations, are not consciously made, nor are they put in logical form; in fact, all the labors of philosophers hitherto have not been sufficient to discover and explain the process by which we acquire them—to set forth explicitly the premises, the reasoning, and the conclusions which are implicit in them."—[Maudsley, Physiology of the Mind, page 32.

"The great source of happiness is to be found in the exercise of talents, and perhaps the greatest of all is when the ingenuity of the mind is exercised in the dextrous employment of the hands."—[Sir Charles Bell.

Models of Leaf Forms



Ambidextrous Designing

These boys are grammar grade pupils. They have had two hours training per week for two years, in drawing, modeling and carving, in rotation. Each time they make a design it is different, and they draw various styles of ornament, besides drawing from objects. Such work as is shown herewith is executed in about six minutes.

Illustration 40

Some Primary Exercises

CHAPTER I

Preliminary Considerations in Manual-Training Drawing

THE FOLLOWING METHODS are advanced with confidence, in view of the fact that there is a general reaction against the printed copybook systems of drawing already described. The unsatisfactory character of such purely artificial, nay, even mechanical aids to the teacher, is now generally apparent, and many teachers and others interested, feeling this lack of results and deficiencies of methods, are already seeking better ways.

Many artists are also becoming interested in the education of children in art work, and are practically unanimous in their condemnation of the old systems. Indeed, it is hardly possible to name an artist of any importance who agrees with the systems in general use. Artists, usually, are not much engaged in public affairs, but when one of them does look into the usual methods of education, it is generally with an expression of amazement at the feebleness and utter inutility of the art instruction received. Artists

are beginning to be more interested in the subject, and several voices have of late been lifted up in not uncertain tones, advocating a change to rational ways of work that will produce useful results.

When artists are spoken of in this connection, real ones are meant—those who actually produce art work. I do not mean those teachers of art or of drawing, who have never produced a statue, a model, or a picture. Many of these, unfortunately, are engaged in teaching the artificial systems complained about, and in many cases they have been trained in normal art schools expressly for that kind of work. They never had any real knowledge of art work, and their products are destitute of value, being vitiated by all the intricate inanities of the systems indicated. Artists must, ere long, combine against the errors in education mentioned, and it is only because of ignorance of actual school processes that they have not been already aroused. Surely, their judgment should be consulted as to what is best to do, even if they are not teachers. Some of them are sufficiently interested to condemn false work, and to suggest improvements. I have had many artists visit my schools, and have never yet found any to object to any part of the work, as contrasted with the old methods. They usually

Illustration 41

First Exercise, Manual-Training Drawing

Illustration 42

Manual Training Exercises
These grammar grade pupils are trained by the ordinary teacher

endorse even the most radical changes we have made—changes that are the result of experiment—from the standpoint of the artist, not of the teacher.

It is to be distinctly understood by artists and art teachers who read these chapters on "drill" work, that these exercises are not intended to take the place of art teaching of various other forms—the drawing from objects, the study of perspective (in its right place), the use of color, light and shade, etc. But the object of these exercises is for the definite purpose of supplementing art work in all directions, and primarily for giving fundamental skill and dexterity to the hand as an instrument. All art teachers can realize the value of a ready hand prompt to obey the mind, one that by training is thoroughly co-ordinated to perform all movements with facility as soon as thought. Especially is this appreciated if time is saved, and certain qualities—such as balance, proportion, magnitudes, space relations, etc., are made automatic (see page 77) and, at the same time, the mind is stored with all the common and conventional forms and units of design of the best periods and of the different styles or schools of art.

Teachers must realize also that only a very short time need be given to this drill work, about ten minutes each lesson, provided it starts at the nascent or incipient period of childhood. Also, that in all cases, the drill work

in delineation is accompanied by form work on paper, in clay modelling from forms, and (if children are not too young) by wood carving of various forms. Of course, if children or adults have passed the nascent period for this work, extra time must be given to acquiring the desired facility; for few can be found now to dispute the desirability of real manual dexterity for each hand *for all* boys and girls whatever their future life may be, apart from the idea of drawing as a mode of thought expression for educational purposes, and as a means of correlating all the various studies. I do not think a psychologist can now be found who will not strenuously advocate real drawing and proper manual training as one of the chief means to reinforce "knowledge," and to make it "wisdom." They will advocate it as a means—through motor movements and touch sensations— of awakening and making still more alert the brain, which is far too frequently made dull and torpid by too much verbal memorizing, too much print, too much "telling," and too little doing.

The drill forms in delineation, then, are for the purpose of getting automatic facility for motor centers of the hand, just as all other modes of expression require automatic facility, as in speech, writing, singing, playing on instruments, etc. A course of this drill work alone is folly, but accompanied by the other forms of art work and nature study, is of inestimable

Illustration 43

Ambidextrous Co-ordinations in Four Directions

Illustration 44

Free Hand Drawing
Grammar grade pupils making original designs

educational value. The forms have been arranged in the order of their difficulty, not in the logical order. First, easy line exercises are given, then simple units of design, then complex exercises and units of design, and so on.

It is not expected to at once overcome all the evil effects resulting from art instruction having been left so long in the hands of mere book publishing concerns and their agents, but I do expect to let in some light on the subject. Especially do I expect to see the artists, and people who are authorities on these matters, become interested in the question and to see them earnest advocates of newer and better methods. If this interest is once aroused, we need have no fear as to what will ensue.

The Two Kinds of Drawing.—Many will think that too much time and space have been given in this book to the manual-training drawing and drill work, at the expense of the equally important work of drawing from nature and art forms. This has been done intentionally. The value of drawing as manual training, and of manual training to right and good drawing, has not been sufficiently emphasized in the past. No one advocates more strongly than I the importance of drawing from nature and art forms, but I also recognize the importance of manual training and drill work as

elementary to and supreme for the best results in art work and nature study. For this reason I have given the manual training part of drawing in considerable detail.

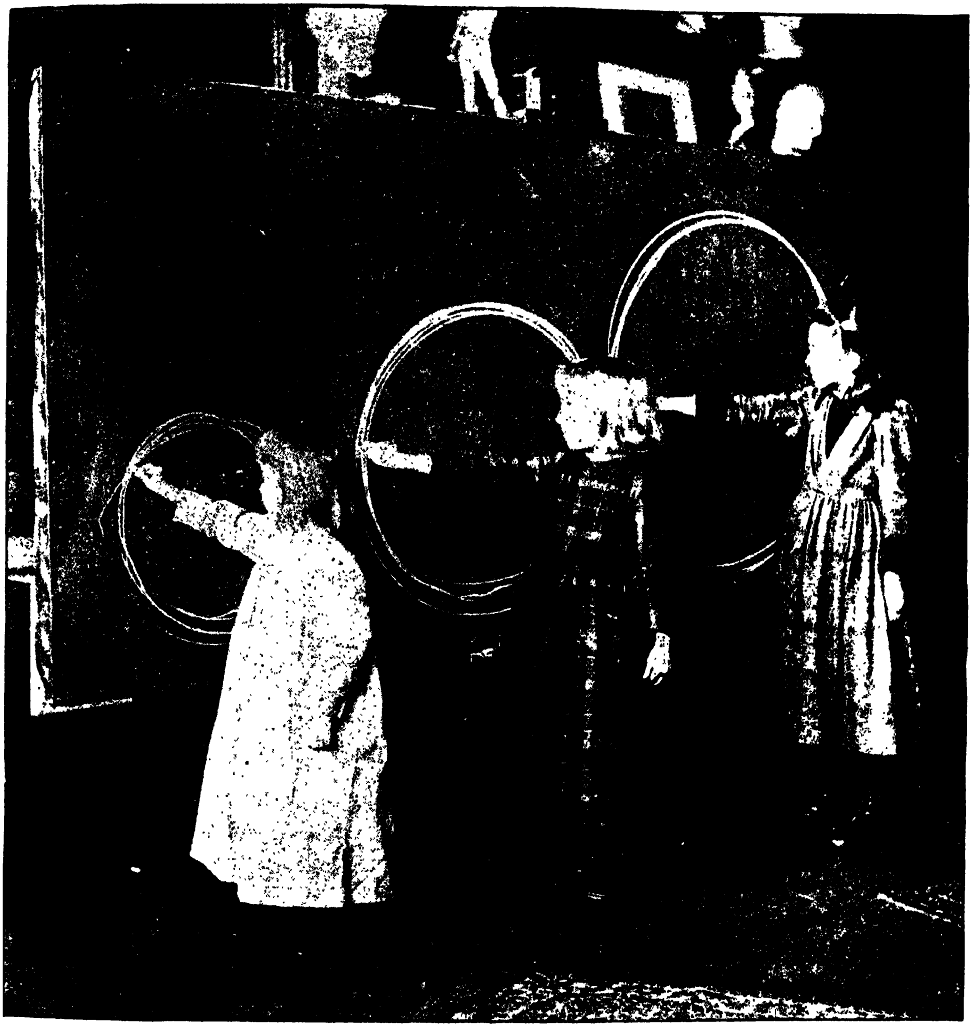
The distinction usually made between the manual training idea and art work is a false one. They are two sides of one fact, equally important and equally worthy of receiving all possible care and attention.

In devising the series of drill forms in manual-training drawing given in this work, it should be distinctly understood that any forms or like characters can be used. I am aware that the moment set things are suggested as necessary, routine will begin. The teacher should be constantly on the lookout for new forms. In the very nature of the case, false systems grow out of a rigid adherence to set forms and methods of work. Teachers must change and modify their instruction in accordance with individual needs and environment. The forms given are simply the result of the experience of one person, and, though proved to be of value by their use in large classes, may be improved upon by the experience of others.

Illustration 45

First Exercises. Primary School, Colored Children

Illustration 46



Free Hand Work for Very Young Children

Paper.— One of the best kinds of paper to use for practice work in drawing and for drill work is the common manila paper. Get the light tints, as they are the best for drawing, although any kind can be employed, the kind that weighs 36 pounds per ream, costing about $3, is here suggested. The sheets can be cut in half, giving the liberal size of 18 by 24

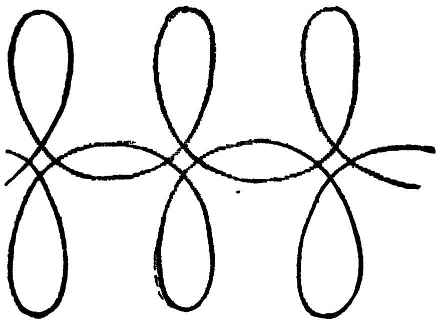
inches. This will cover the top of any ordinary desk or table, and as it occupies all the space in front of the pupil, the hands can move with freedom over the whole sheet. I use this paper because it is very cheap and quite as good as the white drawing papers for practice purposes. It can be purchased with any kind of texture, glazed or rough. Manila paper is good, even for designing and making of patterns, on account of its texture, strength and durability.

For practice purposes I have the children draw on both sides. Usually we cover the paper all over many times with the drill forms. This paper also takes India ink, or the common black inks; of course it is not quite so good for color work as the white paper. I have settled on this paper after trying many other kinds.

Pencils— No Rubber.—Ordinary school lead pencils will do for drill purposes; the best kind is a good, medium-soft pencil. Do not allow rubbers to be used; it simply wastes time, while no good is accomplished. It is, in fact, very important to break pupils of this habit of using rubber. Some children, and even adults, seem to think that the first marks must be rubbed off in any case. In some schools, it seems impossible for the pupils to draw unless they have a piece of rubber in the left hand.

The habit must be formed of putting down the required touches at one touch *to stay*. This can readily be done and gives greater freedom and accuracy than when feeble tentative touches are made, with the idea in the mind that they must be changed several times before they can be right.

Illustration 47



CHAPTER II

Elementary Drill Forms *

THIS INSTRUCTION and the exercises in drill work can be given by the teacher to a large number of pupils at once. This will save time and talking on the part of the teacher. It is advisable at intervals to call the attention of the whole class to certain facts. The most convenient way to do this is to ring a bell, when all the pupils cease working and can listen to the teacher's directions. Pupils working at desks on paper can make forms reduced in size from blackboard work. The series of marginal forms here given are intended to illustrate a graded set of lessons. A large number of forms are given, so that the teacher may make a judicious selection therefrom. Bright teachers usually make numbers of other forms, and in a very short time have a collection of their own. I like my pupils to forget all they have learned and studied of other systems, for the time being. New pupils, those who have never received any instruction in drawing, while they may be very backward with hand training, are more pliable and grasp the forms very readily, perhaps more readily than those who have been trained in other directions and who have various faults to correct; especially those who have never been taught to make a firm, clear, decided line with a single stroke, but have been taught to dot their lines or to lightly sketch their lines, making a series of tentative

*All of the cuts, excepting a few of the most complex ones, have been drawn by children.

Illustration 48

Free Hand Exercises in Straight Lines

touches, with the intention, later on, of making the marks or strokes better. In the old-fashioned drawing methods, this is called "lining in." No one can think for a moment without realizing how stupid it is to make several attempts or to work in that way, when, with very little practice, firm, clear touches can be made from the start.

To Get Automatic Facility.—I have repeatedly spoken of the desirability of facility in the beginning. These first exercises are chiefly for the purpose of acquiring facility,—actual manual training, the power to make the hand obey the dictates of the mind, to make the hand obedient to the will. It does not matter in the beginning how crudely the pupil makes the forms. Habit and repetition will correct that. Give all the attention in the beginning to position, distance, movement, and the like.

The pupil should learn to draw as automatically as he learns to write.

Some of the written letters of the alphabet are exceedingly complex, embodying difficult compound curves, and growing still more difficult when combined with other letters to form a word. Notwithstanding this, the dullest pupil, by constant practice, makes each one of these complex characters unconsciously. The movements of the hand in writing are automatic. When the pupil desires to express himself in words or writing, he is not obliged to "lightly sketch" or "line in" the different characters or letters. His mind is occupied with the *idea* he wishes to express upon the paper, and his hand moves automatically, without a thought being given to the different positions required to form the lines and curves which go to make up the written word.*

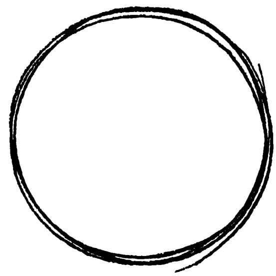
Just so it must be in learning to draw. The different movements must be practiced till they are drawn with as little effort and as unconsciously as are the letters of the alphabet. No special talent or genius is necessary in order to be able to write well. The same is true of drawing, in the mere acquisition of the mechanical part of the work. Talent and genius are required for the higher grades of design and creative work, just as talent and genius are required to express great thoughts in written words.

The First Exercise Is the Circle.—It should be drawn with the right hand directly in front (Illus. 40, 41, and 49). Let the circle be about six inches in diameter. Do not make the circles too large in the beginning, but later on they can be made of all sizes—as large as the arm can sweep or as the blackboard

* "It is easy to perceive why will can only determine the *result* when it dictates an act, and cannot determine the action of a particular muscle, or the combined actions of certain muscles which have not acted together before. All it does is to let loose, as it were, the proper agency in the motor center; and this is done by willing the event, which it is enabled to do by means of the proper motor intuition. When I will to utter a certain word, I will the event, the complex articulating movements being possible to me only through the medium of the proper motor intuition. The impulse *plus* the special motor intuition constitutes the particular volition. A voluntary movement is truly a reflex act in the cortical centers of the brain; differing from the lower reflex movements in these circumstances—first, that it does not immediately follow the stimulus, but is caused by the excitation of many associated sensory residua which have been laid up in consequence of former experiences; and, secondly, that it contains or evinces a distinct adaptation to an end or purpose, by reason of the excitation of associated motor residua which have been organized effects of former adjustments. If the result wished is a new, unfamiliar one, no residua thereof from previous experiences existing in the motor centers, then the will is unequal to the accomplishment of it; there is not an exact and definite idea of the end to be effected, the necessary motor intuition being wanting. After repeated trials, the desired skill is firmly acquired, and the movement is thenceforth automatic, the motor intuition having been gradually organized in the proper nervous centers; the result stored up strictly corresponds with that which in other nervous centers we describe as *abstract* idea. It is probable that the so-called motor centers in the cerebral convolutions are really the centers of these motor intuitions; in other words, they are the centers in which the subordinate motor centers act upon consciousness, and they thus constitute the physiological agency of voluntary movements."—[Maudsley, Physiology of the Mind, pages 466-467.

will allow. This graded series of exercises, the result of 20 years' experience, has enabled me to decide upon certain sizes that are more convenient and more adapted for school purposes than others. The circle should be drawn on a level with the chin. All children show a disposition to make it above their heads, to reach upward—a fact of much interest to psychologists and physiologists. Adults who have never had any training usually make their circles too low on the board, and aged people make them quite low—another interesting fact. For our purpose and convenience, we make the circle directly in front, just a little below the eye. See that the body is quite erect, and the head level, and that the hands swing freely around the circle many times. Then, with the left hand draw a circle by the side of the first one (Illus. 41). Practice swinging the hand around until the line flows freely.

Illustration 42



Do not allow the body to sway or swing in doing this, but see that the pupil moves the arm entirely free from the body. The circle is essentially an *arm* movement. Let there be an easy swing of the arm from the shoulder, keeping the remainder of the body in an easy, comfortable position, and carefully avoiding rigidity of the muscles—no tight grip of the chalk. Every movement must be as easy, free and graceful as possible.

At first there is a tendency to put the face close to the blackboard surface, and to turn the head to one side. Resist these desires and keep up the practice till the movement is free and easy. Ultimately all these movements should become automatic, or be made without conscious attention or exercise of the mind. Of course this cannot be expected immediately.

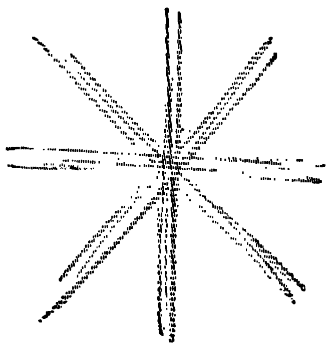
The next step will be to take a piece of chalk in each hand and draw over the same circle with both hands at once Illus. 41). This movement will be rather difficult, but in a minute or two the coordination is made and it becomes easy. This accomplished, the pupil must be trained to swing both hands to the right, then to the left, then in opposite directions, letting each hand go around the circle in a direction opposite to that followed by the other (Illus. 45). This last movement is much more difficult, but in a few minutes it is usually conquered by even the smallest children. These six movements are to be repeated as drill forms contin-

ually, just as the five-finger exercises are practiced on the piano. Do not pay much attention to the accuracy of the circle. It doesn't matter how crude it is in the beginning, facility being the first thing desired. Many children in a very short time can swing perfect circles frequently with each hand.

Straight Lines.—The next exercise will be the making of straight lines for the purpose of gaining facility in this movement. The pupil, standing in the same position as before, must swing the hand up and down vertically, making a line about 18 inches in length. In doing this, pay especial attention to the position of the body. See that it is erect all the time and that only the hand and arm move. Do not allow the body to wave back and forth as the hand moves up and down. Try to make the hand independent. Beginners will invariably sway the body at first. In teaching a large class, say 12 or 20, on the blackboard, it is amusing to see the movements some of the untrained pupils make. This is very readily overcome, however, by drawing their attention to it, and in a minute or two the hands can be made to swing freely, with every figure quite erect, the heads level and at the right distance from the board.

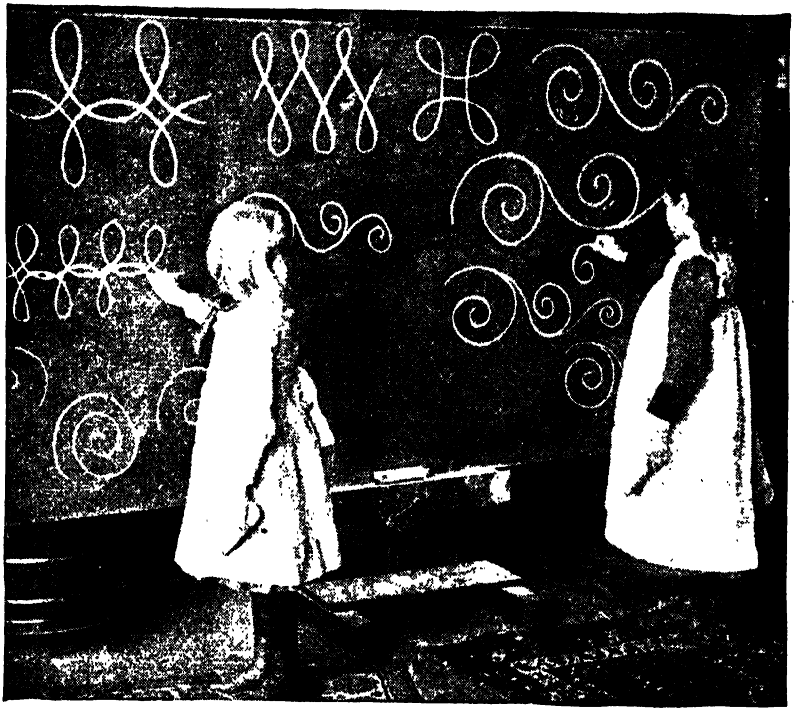
A second line can now be made in the horizontal direction, crossing the first, the hand being kept in the same position, and allow it to swing freely from the right to the left, back and forth, till facility is acquired in this movement. The movements can be followed with the drawing of the diagonal lines, also continued until the movements are made with ease in any direction (Illus. 48 and 50). Invariably, in one or two places, lack of co-ordination will be felt and the line will be crooked and uneven, but very little repetition will overcome these defects.

Illustration 50



It is to acquire facility and control, and to get the actual structural connection and harmony of relation between the hand and the brain, that we make these consecutive movements all around the circle, not with one hand only, but with each hand. Especial care must be given to the left hand, owing to the lack of its use with the majority of people. But with the young the left hand can be made to work with as much freedom as the right,

Illustration 51



Drill Movements and Spirals for Primary Children
The forms are made with either hand

in a very short time, and I see no reason why any of us should not have as much control and power over the left hand as we have over the right. Crudely speaking, we have two brains, a hemisphere for each hand, and only a very dull person will think it necessary to confine himself to the use of one. Usually, in the beginning, a little more time must be given to left-hand work on account of the movements being slower and more awkward through lack of use. (See chapter VI, page 50, Book One.)

The Double Loop (Illus. 52).—In making this form, let it be about 12 inches in length. Very few beginners can draw it so that it will be erect. Usually the force of the writing habit asserts itself and a great many pupils tip this form to the right, finding it almost impossible to make it vertical in the beginning. I have a series of exercises expressly for the

purposes of overcoming the writing habit—the disposition to slope forms to the right. The double loop is one of them. Allow the hand to swing freely, make the two vertical loops equal in size (Illus. 52), and resist the tendency of the chalk to follow continually the same line. Let it move about till the two forms are to a degree equal and the hand moves with ease and facility. Practice the same thing with the left hand. The next exercise is to make the same form horizontally; then to put in the two diagonals, swinging over each loop many times to get facility and to overcome all awkwardness of movement. Practice on the loops should be especially directed to the points where awkwardness is indicated, and continued until this is overcome. This is a beautiful exercise for compelling rectitude and for making balance, proportion and *fitness*. It is quite difficult to make these forms *fit* in the beginning. Do not expect accuracy at first, do not mind how much the forms overlap in getting facility, but as soon as this facility has been attained, endeavor to get fitness and exactness. The same is to be done with the left hand. Many rosettes and forms similar to this can be

Illustration 52

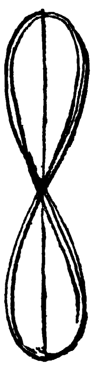


Illustration 53

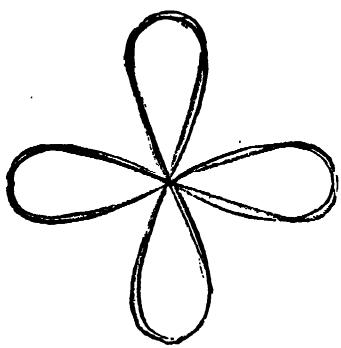
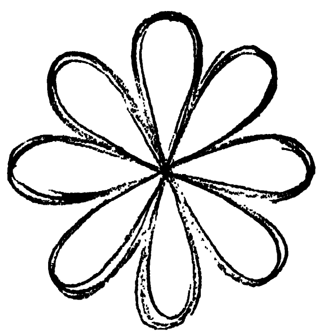


Illustration 54



made. Suggestions may be found in the illustrations in this book. It is a very easy matter for a good teacher to make twenty arrangements of the double loop.

When facility has been acquired, practice this loop as the smaller child is doing in Illus. 51. The pupil must endeavor to make the loops (47) erect, equal in size, and equidistant from one end of the blackboard

to the other. Let them be about six inches in length. Then interlace the loops. It is quite difficult to draw this (Illus. 60) so that the loops will be erect, equal in size, and of equal distance. This is a very good exercise. Do not allow the form to be drawn quickly, and resist the tendency of the hand to move as in writing. Continue the exercise straight across the board. There is a great tendency to let it diminish in size. This can be seen readily when a large number of pupils are drawing the form at the same time. The same exercise can be done with the left hand and many varieties of it can be devised.

Illustration 55

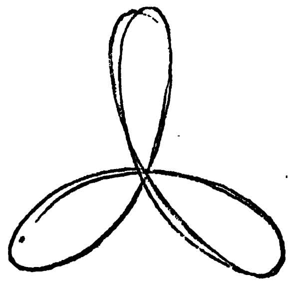
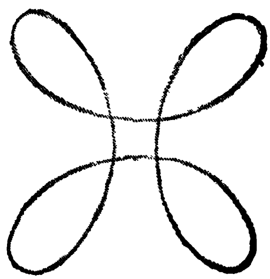
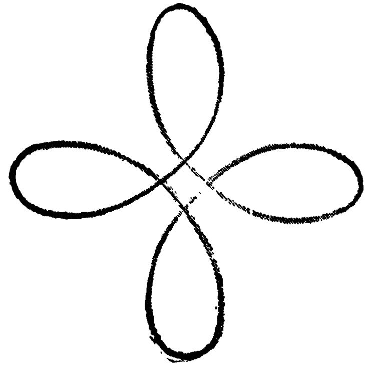


Illustration 56



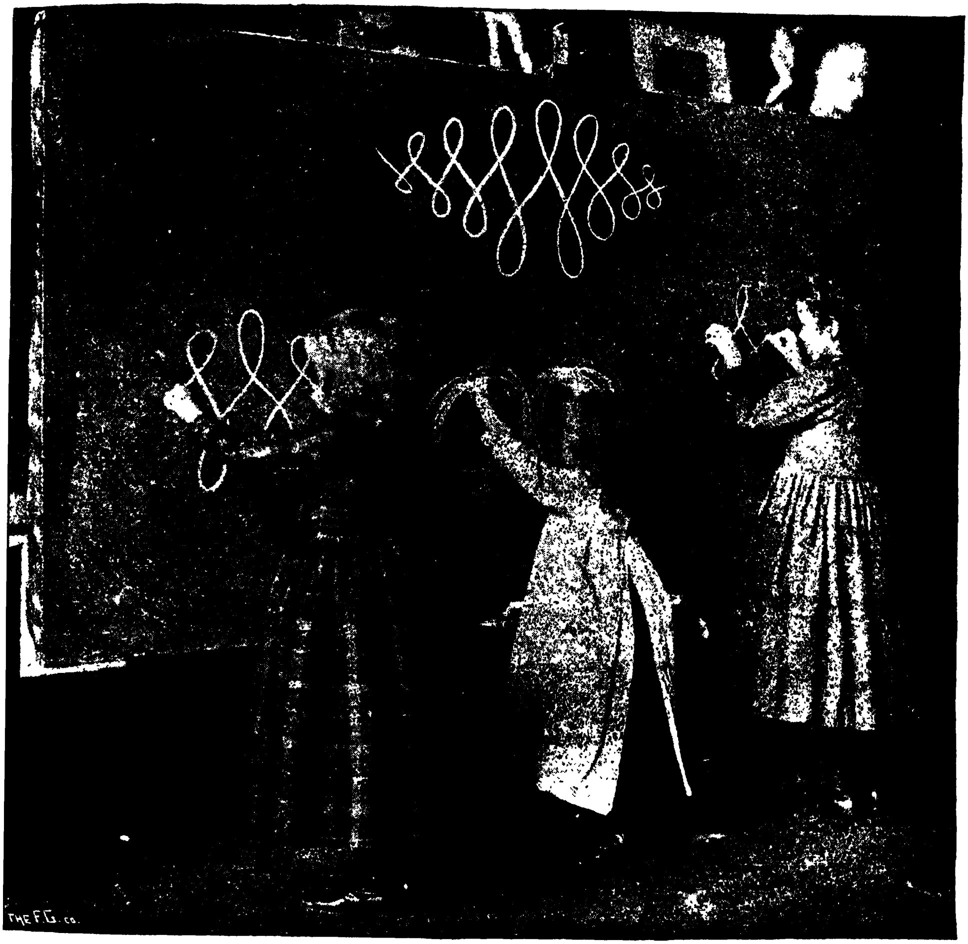
Application of the Loop.—The next is quite an important exercise (Illus. 55). In making this form, draw the loops from six to eight inches in length, letting the center loop be erect and the two side loops balance. The hand must swing freely over these lines till perfect control and automatic movement are acquired. This compels rectitude, balance, proportion and fitness. It can also be interlaced by another similar form (Illus. 59), making, if it is properly done, a complete rosette. This is also to be done with the left hand. This form can be varied in many ways, making use of six, eight or twelve loops, interlacing them, etc., as shown herewith.

Illustration 57



Reason for these Movements.—Only a few of these forms should be practiced at each lesson, it being desirable to give all the period to two or three,—a

Illustration 58



Making Loop Forms With Both Hands, Primary Children

judicious selection having been made by the teacher. It will be found that the forms and the work are a little tedious in the beginning, just as the scales in studying music, or the exercises required in singing, are considered tedious. But experience teaches that these forms, properly carried out, will produce the desired results in the organism in the shortest space of time, and the teacher will realize that to get automatic facility a flow of

Illustration 59

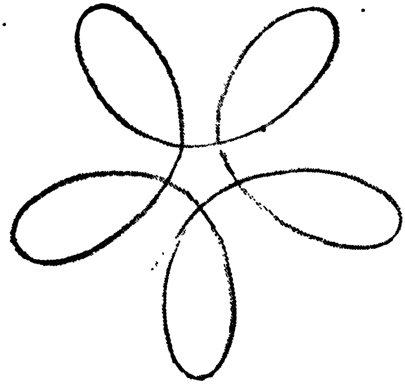
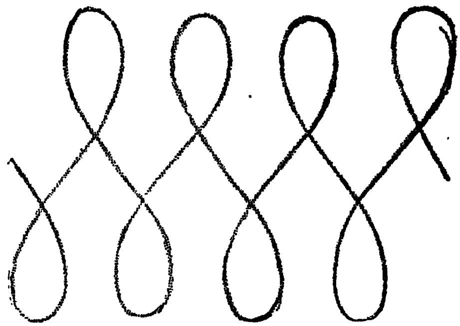


Illustration 60



movement is all-important. Very little can be done in skilled hand training if the movements are made consciously. It is only by making them automatic, thus allowing concentration of thought upon the end in view, that good and skilled work can be done.

The Spiral.—The next form is one of the most frequent in all art forms,—the spiral (Illus. 61). In making this, swing the hand to the center with a single touch. Do not mind how crude it is in the beginning. Begin this from the outside at *a* and aim for the center. Let the end of the line be in the middle, at *b*. Continually practice this form. It is the basis of most designs; it is seen in botanical forms, in the movements of water, air and wind. Even the planets spin in spiral orbits. The endeavor must be to make a true and good curve instead of a bent line. Only by making the swing automatic can this be done. The form must be

Illustration 61

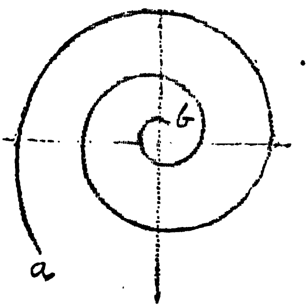
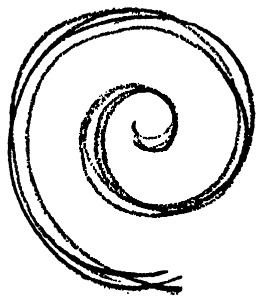


Illustration 62



repeated with each hand in all directions; first, to the right, the left, up and down, and of different lengths.

The next exercise is to double this form (Illus. 63). It can also be made fourfold. Next, practice making the spirals flow one into the other, like No. 65. Let them show gradation. This is quite difficult. Next, make a series of spirals flowing one out of the other and equal in size, as in illustration No. 66. To do this straight across the board, to keep them

Illustration 63

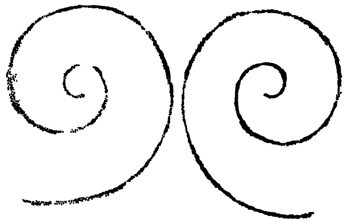


Illustration 64

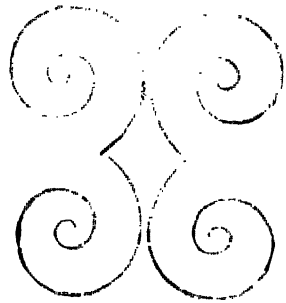


Illustration 65

Illustration 66

Illustration 67 (*a*)

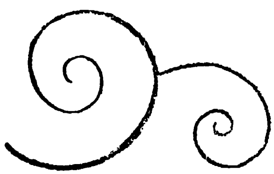


Illustration 67 (*b*)

equal in size and at equal distance, is an excellent exercise. It should be repeated indefinitely. This is one of the most beautiful of all forms and it is used continually in many of the best styles. In fact, it is hard to make a good pattern without introducing this unit. Endeavor to make the lines of the spiral flow one into the other gradually, showing the transition increasing and diminishing. Do not let it be abrupt and angular, as at *a*, but flowing and graceful, as at *b*, in illustrations No. 67.

Modeling and Carving.—Years of experience demonstrate that copying and drawing from models alone on flat surfaces fail to give pupils the free swinging movements so essential in making artistic curves and touches. The hand always seems to lack a certain facility that even many years of work sometimes fail to give. When, however, the hand becomes able to move with ease in soft clay and tough wood, when it has been trained to follow lines and surfaces through these mediums, it is wonderful how quickly the finest and most complex curves can be produced with free swinging lines and touches. In drawing these spiral forms, therefore, and all the other drill forms, it must be understood that the best results can only be obtained when carried out as I recommend in the various mediums—on paper, in soft clay and in tough wood.

The facility and accuracy of form obtained by pupils working this way, compared with pupils who only draw in the ordinary manner, is extraordinary. At first I could hardly believe it possible, the difference is so evident. Experience, however, proves that a much deeper and more lasting impression of form is secured when pupils make the various forms in different mediums. The hand also seems to become stronger and more energetic. Of course, working in wood compels the exercise of greater strength through the hands, and this exerts a favorable influence over the body, especially over the upper part, the arms and chest. This influence is particularly beneficial to children who suffer from the sedentary habits formed in schools, who lack full chests and droop over their work.

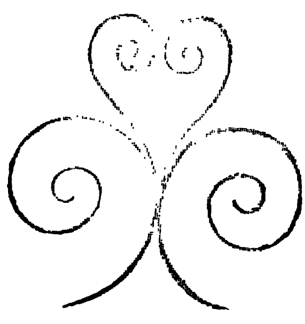


Illustration 68

Memory Drawing

These various bird forms are drawn from pictures and the character and size memorized as much as possible. The forms are repeated until they can be drawn from mental image.

CHAPTER III

Elementary Units

AMONG THE MOST POPULAR FORMS of ornament are the various kinds of foliage. Leaves have been modified for many purposes in nearly all the styles of ornament. There is no end to the variety and shape. For our purpose, we will begin by making a few of the simplest conventionalized leaves, from which we may gradually pass to the most complex. The simple leaf units, I find by experience, are among the best things we have for school practice and drill. They embody all the desired qualities and are perfectly graded, from the simplest leaf forms to the most complex of the Roman acanthus leaf shapes.

Simple Leaf Forms.—Draw a vertical line, about eight inches long, to represent the midrib of the leaf. On each side place a double curve, as in No. 69. Draw the center midrib upward in the direction of the growth of the leaf. This form should be repeated. A very good way is to go over the lines many times till the double curve becomes automatic. The shape can be repeated fourfold (Illus. 70), thus making eight double curves in different directions; this should also be repeated until automatic. It is quite difficult to resist reversing these curves in the beginning, but a very

little practice enables the pupil to get them right and to make good balance, fitness, proportion, etc. The form can be made more complex by adding four more leaflets, forming a rosette (No. 71). This form can be made by drawing the leaflets long and narrow, short and thick, with the complex curve, and the single curve, as illustrated on page 96.

Illustration 69

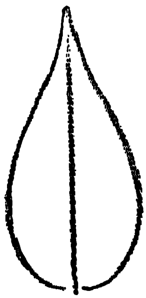


Illustration 70

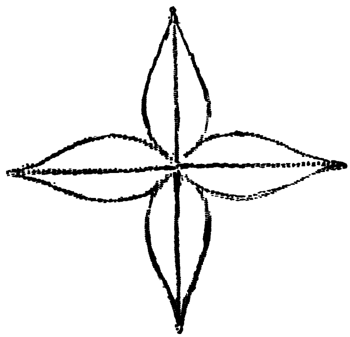
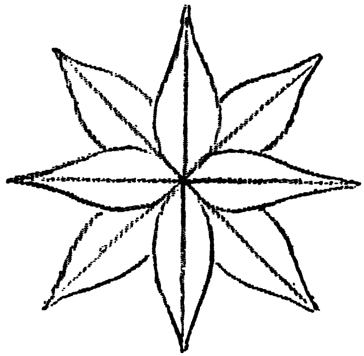


Illustration 71



The Natural Method.—Do not expect this form to be accurate in the beginning and do not allow any ruling of construction lines or measuring. This method is a protest against the use of mechanical or artificial aids, which help the hand at the expense of the mind and the judgment. These forms and rosettes will be very crooked at first, but it is surprising how soon they can be made, by very young children, with precision, as though they were measured and marked off by means of callipers or rulers. The more construction lines are used, the more they will be needed. Abolish them from the beginning. Compel the hand and the eye to obey the mind and to gain proportion and fitness without aids. This capacity is so desirable, so valuable throughout life, in any vocation, that it is hard to think that anyone would be willing to use the crutches which are allowed, and usually prescribed, in most drawing systems.

It has been universally the practice to teach the pupils to measure off these construction lines by artificial aids, thus putting it out of their power ever to be able to dispense with them. Do not mind how crooked the form is in the beginning. I have never yet found a child, after drawing the most crooked rosette in this way, who was unable to perceive its imperfection and was not able, if allowed, to improve upon it. It is this capacity that we wish

to obtain,—the power to compel the judgment to act from the start, so that in the course of time the hand will obey the mind and the habit be formed of making accurate proportion and fitness freehand.* Of course, as facility is gained, accuracy must be tried for.

Children in a very short time can make this comparatively complex rosette form with a great deal of correctness and facility. It should be done with one hand and then with the other. It is a construction, a representation and a decoration, and I think it absurd to separate these qualities, as is done in some "systems," and to give long lists of graded exercises under each head. All of these simple forms are constructions, representations and decorations. It is difficult enough to create the power to make the simple forms well without surrounding the work with a lot of technical and seemingly mysterious terms and processes. Many courses are filled with words like "bi-symmetrical conventionalization," "systematic modifications of geometric," "bi-symmetrical ornaments," "modifications of the round," "kite form," etc. Unnecessary technical terms like these simply tend to obscure to the young that which should be as plain and lucid as the thing itself.

The Next Form is the same as the preceding, only a little more complex—a leaf with three tips or leaflets. Draw the midrib about eight

Illustration 72

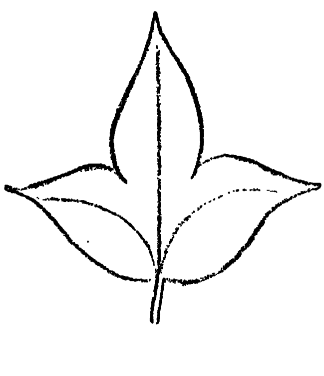
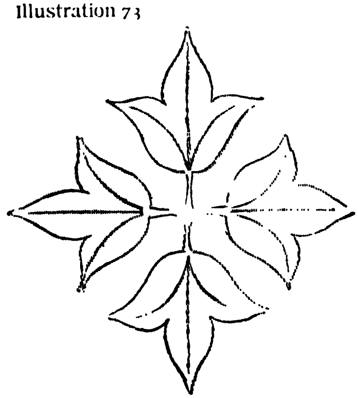
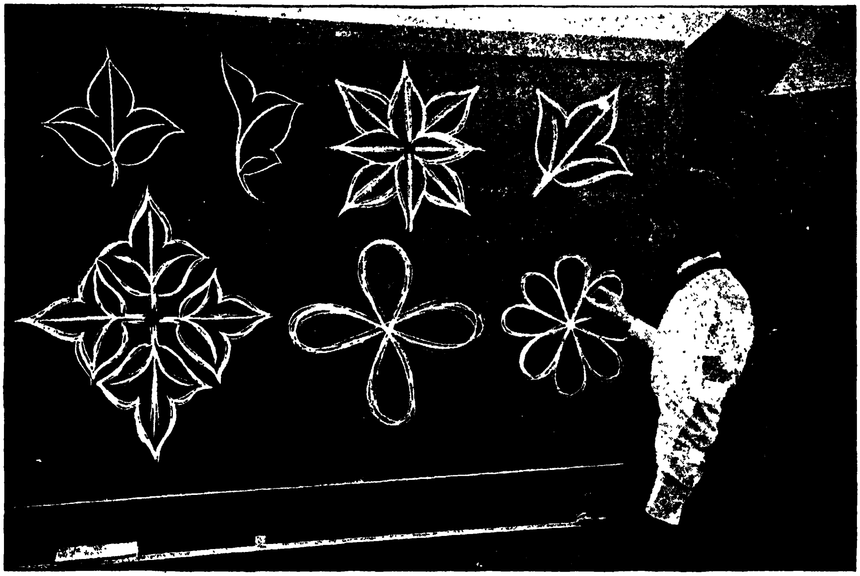


Illustration 73



* The more frequently a voluntary action is repeated, the easier it is to perform, and the greater is the tendency of its constituents (if it is a complex act) to take on the reflex form, i. e., to arrange themselves in a connected series of movements, which runs on mechanically when once initiated by the adequate stimulus.—[Wundt's Lectures on Human and Animal Psychology.

Illustration 74



Drill Work in Leaf Forms and Loops

This picture illustrates a pupil drawing the leaf and loop in various ways. The lines are repeated many times, without rubbing off the forms, which wastes time. By this repetition the child is making the various curved lines, the form, and the space between the forms, organic and automatic, and at the same time facility, rectitude, balance, fitness and magnitudes are being *felt* and planted in hand, eye and mind.

inches in length, balance the side vein on each side, then repeat the double curve to each tip. Let the proportions of each leaflet be about the same. This is a very good leaf to practice on. Do not let the tip be made too small, as is the common tendency with nine out of ten children drawing for the first time. Swing the hand repeatedly over the double curves till they become automatic.

The same thing can be repeated fourfold, making a complex rosette (No. 73). It is almost impossible to make this in the beginning without reversing some of the double curves. Leave plenty of space in the center, and do not mind if it is very crooked at first. This exercise can be repeated till the forms fit each other, leaving a space between each leaf.

No one can see the children draw these forms without realizing what an excellent exercise this is for compelling accuracy, facility, fitness and

some of the most desired qualities in drawing. In a short time the children become able to make these forms automatically. From the beginning, do not allow them to make "construction" lines. Let each leaf be drawn in its turn separately. Do not make the ribs or veins for the four leaves before starting the outline of each.

These exercises are for discipline, it should be constantly remembered. Undoubtedly, by using a few construction lines, the form can be drawn more readily and with much better proportion, but my idea is to get proportion and fitness in the hand, to make the hand feel that proportion and fitness automatically. This can be done and well done if the forms are practiced as described. Thousands of children can make this form with ease in some of our schools, showing that it is not as difficult as it appears to people viewing it for the first time. It does seem surprising to see children make their hands obey their minds with fluency, accuracy and fitness, but it is not so surprising when one has been through the stages and can realize how they become able to do it.

I constantly suggest certain sizes for these forms, because experience with thousands of pupils has proved the size indicated to be the best. There are good reasons for making the forms either much larger or very small, but for general purposes the measurements given are the most suitable. It is quite curious to notice the tendency, among children and adults alike, to show their disposition and their training by the way in which they make some of these forms. For instance, children from the kindergarten will almost invariably make minute, puny drawings. The reverse should be the case. Very small children ought not to be allowed to draw that way, because the brain centers with which the fine finger co-ordinations and muscular movements are made, have not been formed and come much later. In some little children even the bones and muscles themselves are not formed. Nervousness and chorea frequently result from work of that character attempted too soon. Their movements especially ought to be large and free, using arm and hand more than the fingers. I personally much object to paper pricking, paper weaving and a number of other similar occupations in the kindergarten, for the same reason.

Conventional Forms.—These leaves here given are conventional in form. Some teachers may object to this, thinking it essential that children should make realistic forms before conventional ones. A little thought,

Drawing and Painting Class—Grammar Grade Children, Public School of Industrial Art, Philadelphia

This room is one of three used by about 1000 pupils and teachers of public schools. Each pupil uses the rooms two hours each week, drawing, modeling and carving, in rotation. One side of the room is devoted to blackboard work, with room for eight pupils to work at once.

however, should convince them that if they are troubled with the details and myriad-fold markings on leaves, it will be impossible for them to get facility and speed; but if they work on a few typical or conventional forms of leaves until they can instantly draw them in any position, of any size and proportion, and to fit any space, then it will be easy to grasp details, and with very little practice many kinds of leaves and forms can be put down. We must, as Michael Angelo said, "purge a thing of its superfluities and grasp the essentialities."

Pupils who have arrived at this stage can make many designs by using these simple forms. They have already some capacity in this direction. From the start children must be encouraged to arrange these forms in beautiful ways, to make appropriate patterns for various purposes, in order to allow their creative capacity to come into play.

Units of Design Based on the Spiral.—The power having been acquired to make the spiral, a large series of units of design can be based upon this line. In making the first one, the scroll (Illus. 75), draw the outer line first, make the ball come as near the center as possible and endeavor to keep the lines equidistant. This is really a form, the delineation of a solid, one of the forms used in all the arts. It is made in metal,

Illustration 75

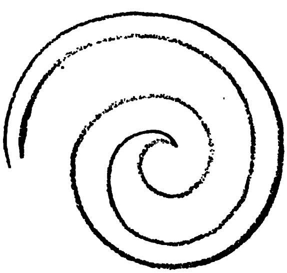
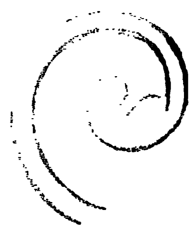


Illustration 76

Illustration 77



carved in wood, modeled in clay and used for a great variety of purposes. Do not make the form reversed, as in No. 76. It is a little difficult in the beginning for some pupils to grasp the shape, but it must be practiced continually until it can be made automatically. The forms illustrated at 77 and 78 will be found useful for practice also, and are based on the same shape, with

slight changes, but increasing complexity. Each of these forms is used in some of the best styles.

Do not allow the children to create freak units. We have so many to choose from among the best styles that it is absurd to expect them to create units of design at first, as is done in some of the poor systems of drawing in which children are expected to create forms. In such cases, the children invariably produce poor and feeble forms.

The Crocket.—We next have a series of forms making use of the crocket. We should practice this form first with the crocket consisting of

Illustration 78

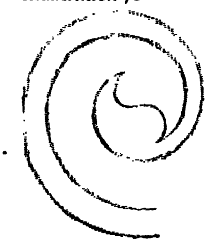


Illustration 79

Illustration 80

a single curve on the outside and inside the scroll, as illustrated at No. 80. After this has been acquired, try to make the crocket with the double curve (81). This is much more difficult and requires a great deal of practice, much dexterity being required to get these double-curved crockets so that

Illustration 81

Illustration 82

they flow and have grace. This is one of the units (see also 81 and 82) that must be practiced continually and for a long time.

Do not expect the children to make some of these difficult forms readily. Remember, they have years to practice them in. Some instinctively

Illustration 83

A Variety of Units of Design Based on the Spiral with Various Crockets
The pleasing forms should be memorized

let the lines flow with gradation, beauty and grace almost from the beginning. With others it requires a good deal of practice to get the very delicate transitions, from one curving to the other, that are exemplified by this form. It can be made to look quite clumsy, and it can be made with a great deal of beauty and grace. This is true of all the forms given.

On the Elements of Design.—Now that we have some units of the regular styles, we shall in every case hereafter in practicing these forms, make the form to get (1) balance, (2) proportion and (3) fitness. Do not let the pupils practice any of the shapes given without trying for these qualities. Very good simple designs can be made by using these forms; the children in the primary schools can make them with a great deal of facility.

Illustration 84

This pupil is practicing the scroll and various crockets. Repetition will enable the hand to make the form any size and proportion with clear swinging lines. When it can be made freely this way, beautiful flowing designs can be produced.

From the very beginning, originality of arrangement must be encouraged. Be sure to have the children make their patterns for

some definite purpose and be able to specify what they are for, thus associating in their minds the drawing with some object for use. It seems very foolish, as is sometimes the case, to find a number of children in a class unable to state for what the drawing they have been making is intended. When you ask them they say simply, "it is a pattern" or "a design," and when pressed for further information about it, they say, "it is for the teacher." This shows that they have not made any mental connection between idea and subject, and the work soon becomes irksome unless they have an object in view.

It is wonderful what a variety of patterns children will make spontaneously and bring to the teacher if they are encouraged to make designs for various purposes about the house,—designs for carpets, wall papers, hangings, metal work, chandeliers, brackets, registers, fixtures of different kinds,

Illustration 85

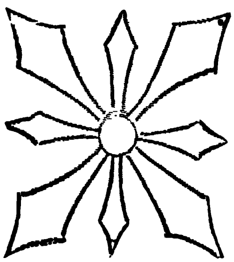


Illustration 86

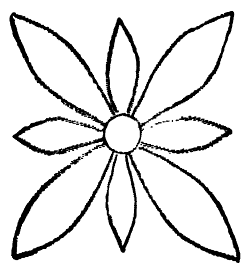


Illustration 87

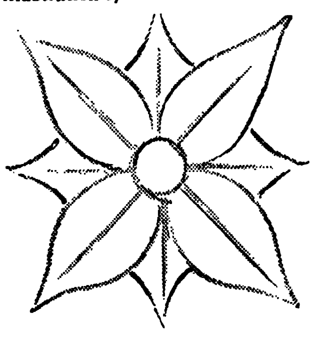
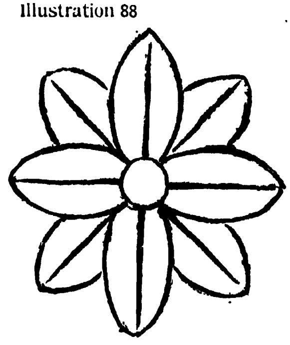


Illustration 88



Rosettes for Drill Work

carving on furniture, chairs, tables, sideboards, frames, hat racks, etc.; designs for pottery and dishes of various kinds. The children instantly see the connection and take a great deal of pleasure in making these forms; and

by using the objects in their own homes they are inspired thereby to better work. Parents and friends also become interested, especially when they see the practical application of the work.

Combinations of Units.—The children should be encouraged, as a unit is thoroughly mastered, to double it, first in simple positions and then in complex ones, as shown in variety in Illus. 89 to 92. It is surprising in how great a number of positions the simple scroll can be placed.

Illustration 89

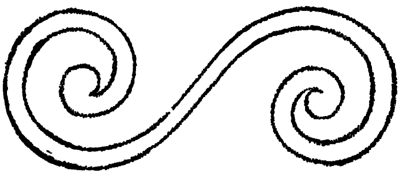


Illustration 90

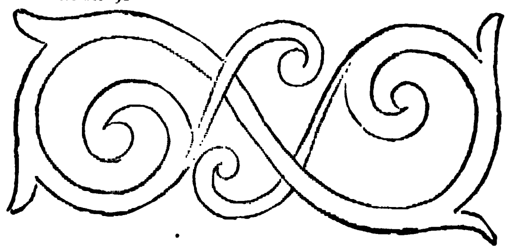


Illustration 91

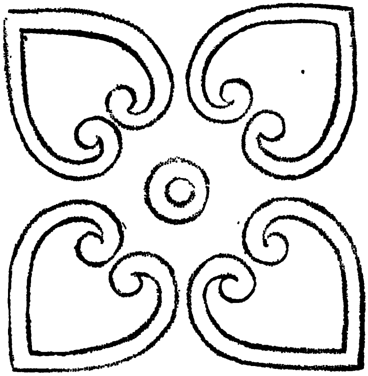
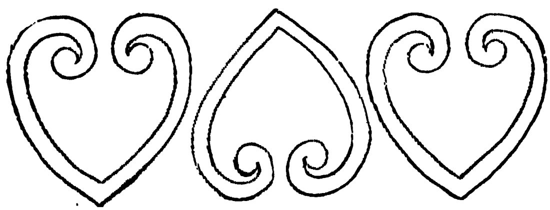


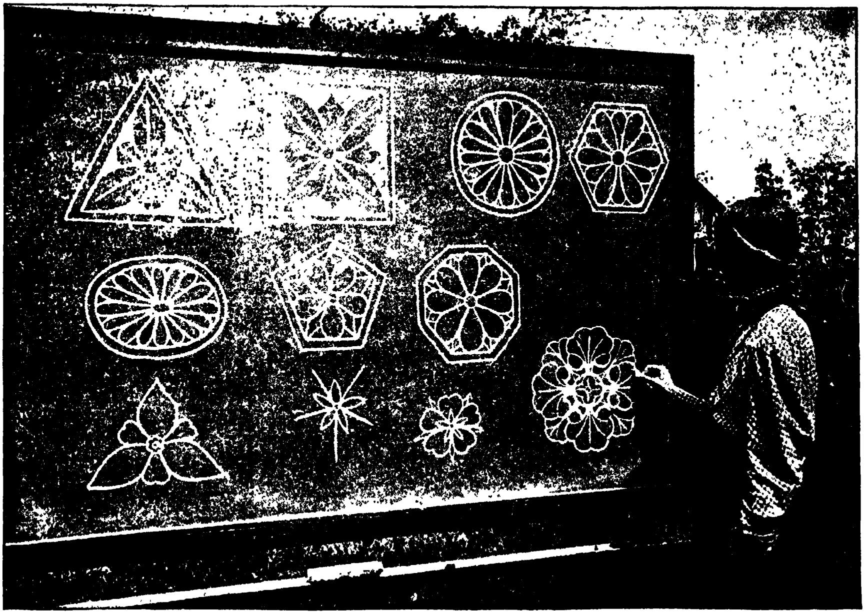
Illustration 92



The children must be encouraged continually to arrange all the units in this way, so as to form different combinations. Do not let them copy only the combinations given here, but encourage them to form combinations of their own.

A very beautiful series of exercises for beginners can be practiced in making rosettes, using the simple lobe or leaf form. The rosette can be placed in a triangle (Illus. 93), in a square, in a circle, in an oblong, in a pentagon, in an oval form, in a hexagon, in an octagon, and so on. There is no end to the variety of simple shapes that can be made this way. It is a beautiful exercise for fitness and construction. Make the square, or oblong, and all construction lines entirely freehand. Do this from the very begin-

Illustration 93



Blackboard Exercises—Drawing Rosettes

It is excellent practice to make similar rosettes fit and fill different shaped spaces. The hand and mind soon grasp the idea of concrete size on the flat surface, and become able to make definite proportion automatically in any position. The children practice these forms entirely without construction lines.

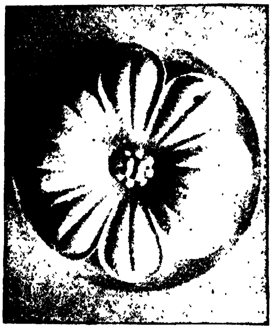
ning. Very young pupils make very irregular forms at first, but they soon begin to get a certain amount of proportion and gradually gain the correct shape. *Do not* expect little children to make perfect forms. Accuracy comes by degrees. Facility first, then accuracy.

Leading Lines.—So far we have chiefly been studying units of design. Now that a number of units have been mastered, we can take up the subject of leading lines, one of the most important things in designing. In all patterns there are a series of fundamental lines that can readily be seen by any one who will study them. On these leading lines the units are placed, and in accordance with the character of their arrangement will the pattern be beautiful or the reverse. The basis of leading lines is the spiral, one form flowing out of the other, as in Illus. 96 and 98. If this form is doubled or made fourfold, we at once have an arrangement on which any of the units

of design can be placed, making a pattern that is beautiful or not, as the arrangement is beautiful or the contrary.

Practice many simple arrangements with a few curves first. In making arrangements do not allow the spiral to be made the same size. This is one of the universal tendencies of a beginner. Insist on variety. Let some of the scrolls be large, some medium and some small. Let them show a certain amount of growth, as a plant grows. They should display a certain amount of branching also.

Illustrations 94-95



Rosette Models for Drawing and Modeling and Carving

Attention must be given also to compactness, to radiation and to tangential flow of line. A very good exercise for practice is to make a number of tangential curves flowing from the spiral (Illus. 99). This must be constantly practiced till the forms flow and branch out without angularity or stiffness. Good tangential curvature must become automatic and organic. Very little

Illustration 96

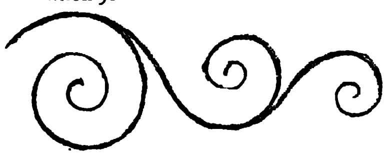
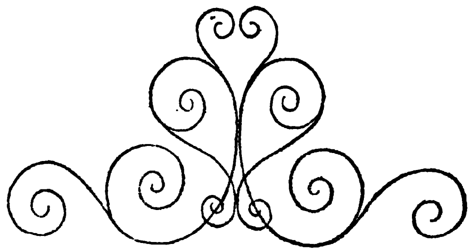


Illustration 97

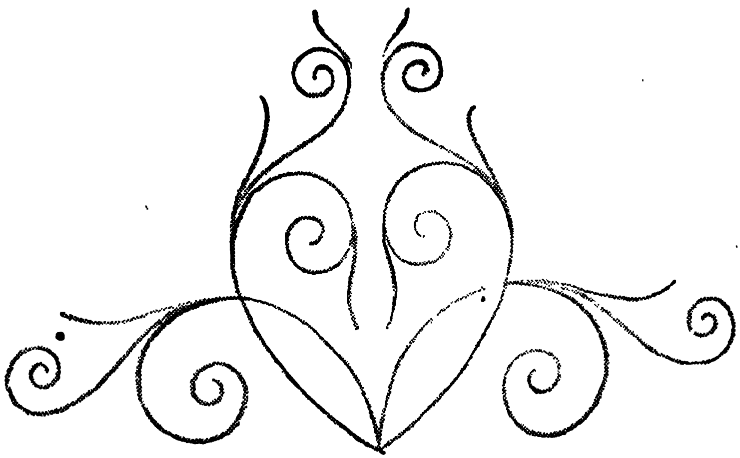
in the way of fine designing can be done till the hand makes these movements automatically and with absolute freedom. If we have to think of the transition of one line into the other, it will never be graceful. That duty must be relegated to the spinal centers.

Illustration 98



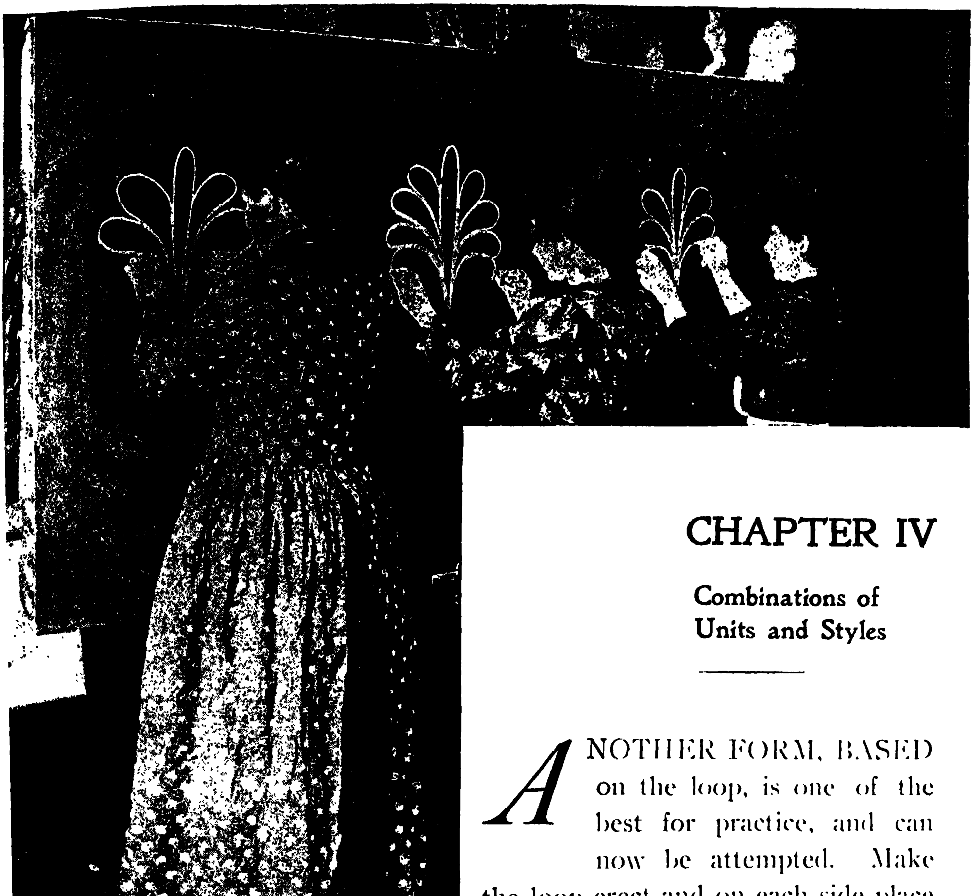
Resist the tendency shown by a great many beginners to make a series of little curves all alike and flowing in a like manner in different directions. Try to get a certain amount of strength in the patterns, a certain amount of interlacing, and at the same time a certain amount of simplicity. There will always be a few main or fundamental curves that can be readily seen, no matter how complex the pattern may be. From these main curves the minor ones can branch out. Very little can be said in the way of rules and laws with regard to the real truth of arrangements. Like harmony in music and meter in poetry, it must be felt, it must be part of the organism.

Illustration 99



A Suggestion in the Use of Leading Lines
Many arrangements of leading lines should be made for practice

Illustration 100



Drill Forms—Teachers Practice in Unison

CHAPTER IV

Combinations of Units and Styles

ANOTHER FORM, BASED on the loop, is one of the best for practice, and can now be attempted. Make the loop erect and on each side place two or three lobes, as shown at 101. See that the center lobe is quite erect, or vertical. Let each one of the side lobes curve a little more, increasing in magnitude and then diminishing. This form can be made with five, seven, nine lobes, etc. Properly drawn, it makes the anthemion, one of the most beautiful of all Greek forms. It is quite difficult to get the side lobes to curve and at the same time to show gradation and fitness, but comparatively little practice will enable one to do this. This form must also be practiced with both hands, it being one of the very best exercises for ambidextrous practice.

Illustration 101

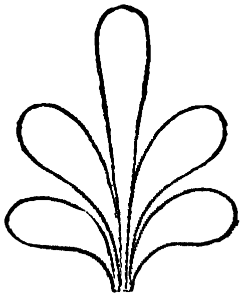


Illustration 102

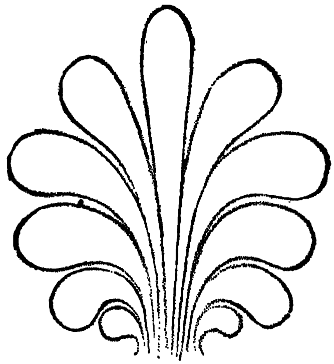


Illustration 103

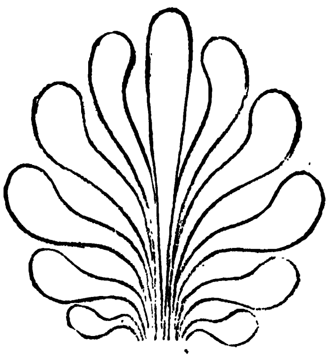
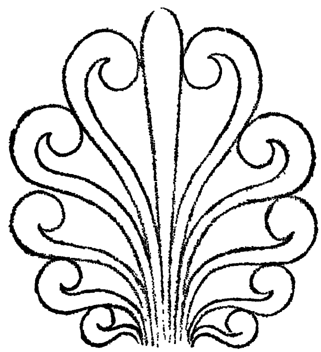


Illustration 104



The Anthemion.—This form can next be practiced in the four different directions illustrated in 106 and 116, making another beautiful rosette form. To do this successfully, so that the lateral movements may be right and the drawing erect, requires a great degree of manual dexterity and physical co-ordination, but children in the primary grades can readily make this form after a few months' practice.

It is important that children should understand the meaning of the forms drawn by them, and when they are producing one they ought to be taught what it embodies. The anthemion is a fundamental Greek form, and, properly drawn, possesses a variety of qualities. For instance, the center lobe contains straight lines. The form has a graded series of curves from a straight line to an acute curve. It has balance, proportion, fitness, grace

Co-ordination of Motor Centers

This exercise illustrates how readily children can make complex physical co-ordinations in all directions. The exercise is repeated until the child can swing all the various curves with (1) facility, (2) balance, (3) proportion, (4) fitness, grace and beauty, automatically. Mental co-ordinations are being made, as well as physical. All the varieties of the anthemion should be practiced in different sizes and memorized. The children should be encouraged to draw them in lead pencil and to note variety of forms on surfaces and in material. This form is the basis of some of the most beautiful of decorative forms.

and beauty. It has tangential curvature of lines. Its magnitudes are well proportioned. It conforms to a great many of the natural laws and the laws of art. It has a certain amount of growth, radiation and distribution, and hardly an abstract idea of form can be conceived that is not embodied in this shape. This is the reason it was used by the Greeks in preference to almost any other form, and I believe it was for this reason that they used it as the antefix of the Parthenon.

Illustration 107

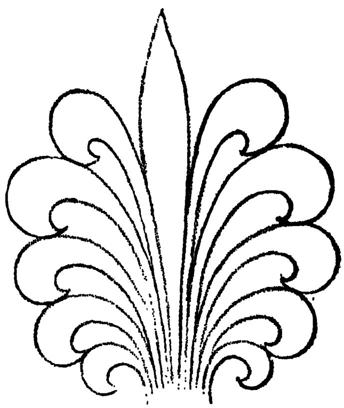


Illustration 108

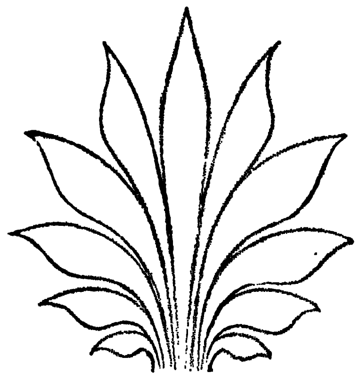


Illustration 109

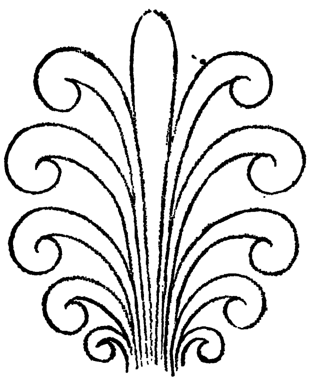
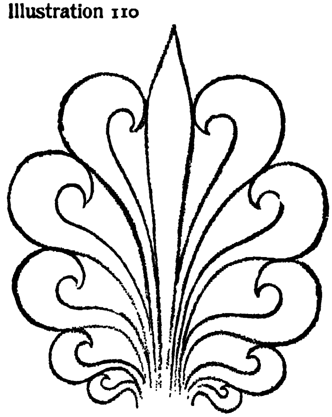
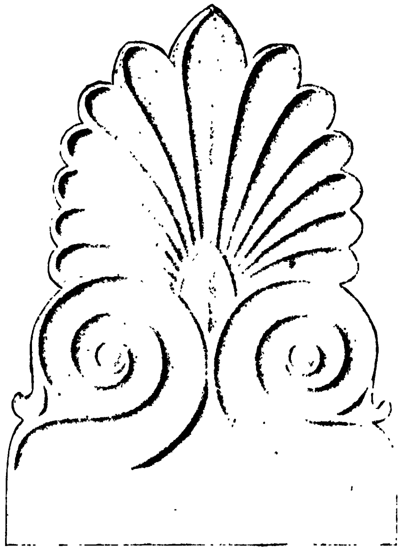


Illustration 110



Varieties of the anthemion can be made in a great many ways, as here illustrated. Names have been given to many of these, as the honeysuckle, the palm, etc., but as used by the Greeks it was simply an ideal form and not an imitation of any one plant.

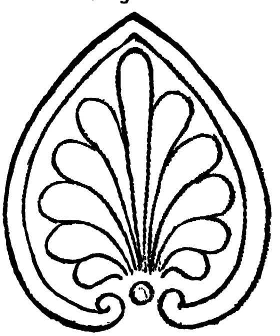
Illustrations 111-112



Plaster Models from the Antique

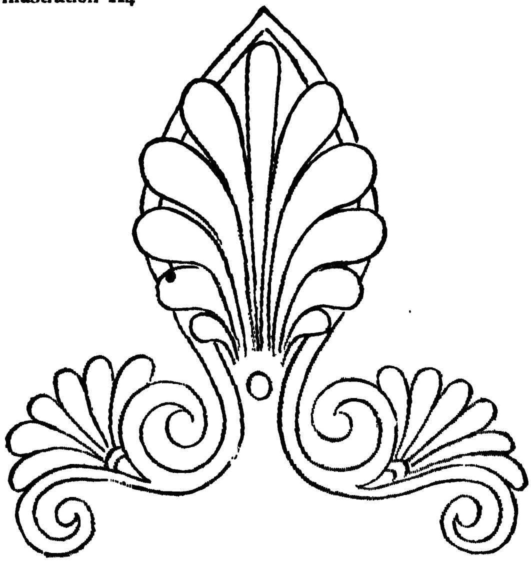
Combinations of the Anthemion.—When facility has been acquired in making this form, a very good exercise is to combine it with the scroll (Illus. 113). In the beginning, make the form without many lobes, taking particular pains to make the lobes fit each other and fill the space equally. This is a little difficult, but if practiced continually, a short time will enable one to make the most complex of lobed forms with ease and beauty. After trying the simple ones a number of times, then more elaborate and complex ones can be attempted. No. 114 is a very beautiful form, combined with the scroll, and can be used for an endless variety of purposes. It can be made short and thick, long and slender, and can be compressed or extended to fit almost any space. With the introduction of crockets, first, the single crocket and later the double-curved crocket, it can be made to look still better, as illustrated in Figures 115 and 120.

Illustration 113



As soon as facility is acquired in making this form, which should be practiced with each hand, and as soon as the power to make it with balance

Illustration 114



and fitness has become automatic, it can also be practiced with the scroll combined another way, as in No. 120. In making this, draw the lobes first, with both hands and then the inclosing scrolls. Endeavor to make the forms fit. This is a good exercise for teaching compactness and the filling of space, and may be performed in a variety of ways (Illus. 120). All of these forms should be made fourfold as soon as the first form has been memorized, for once these forms are fixed in the mind they are not forgotten, but can be called upon almost without consciousness.

Illustration 115

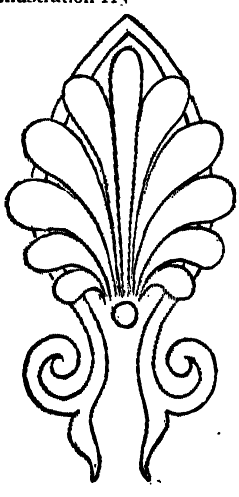


Illustration 116

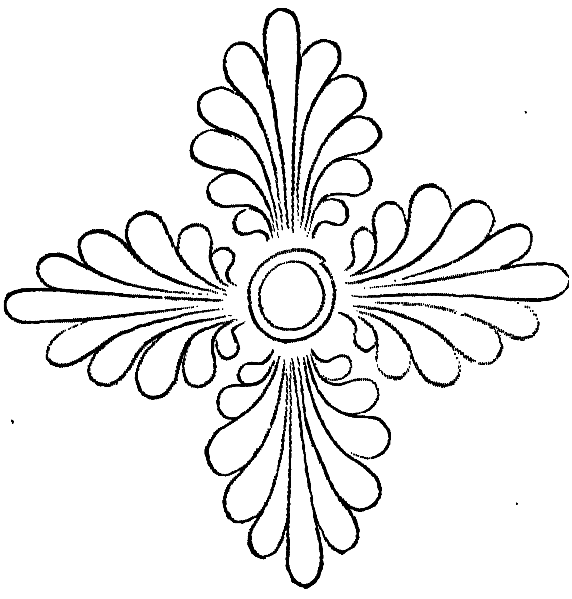


Illustration 117

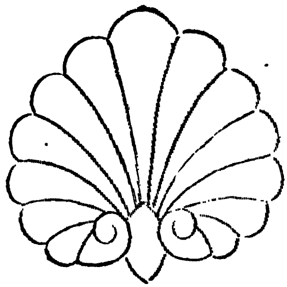


Illustration 118

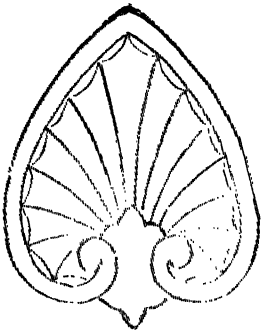


Illustration 119

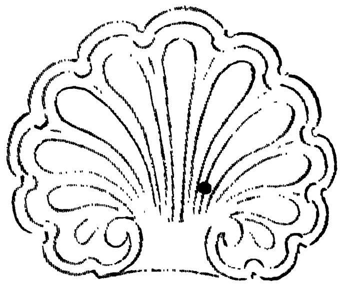
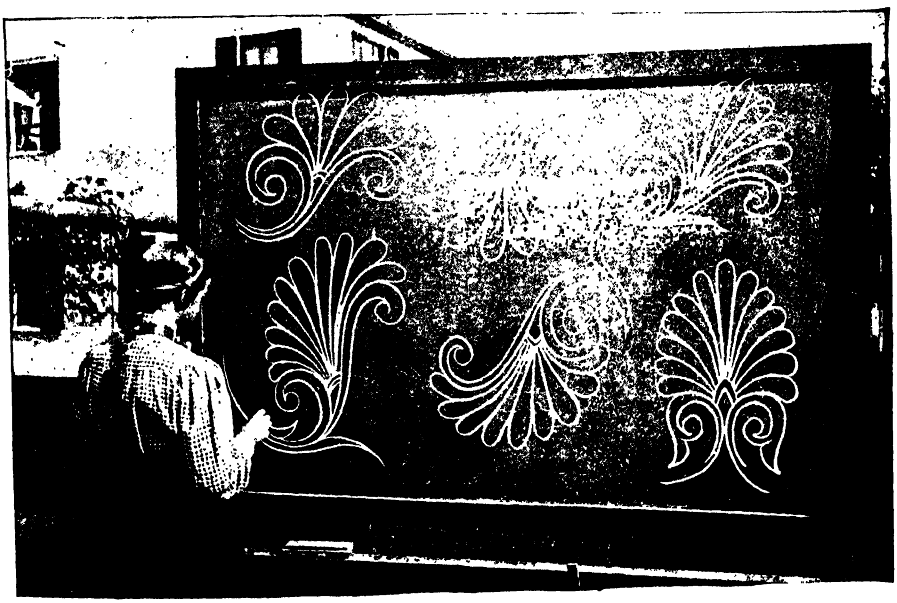


Illustration 120



Anthemion and Scroll

These forms, varied in size and proportion, must be drawn with clear swinging touches until they can be made without conscious effort. The basis of the seemingly complex form is the spiral and loop. When once facility and magnitudes become automatic, beautiful forms result.

Complex Leaf Forms.—The next step is to make a leaf with five leaflets, palmate in shape. Proceed in the same way as with the three-pointed leaf (page 89), making the midrib first and two curves on each side balanced, then the double curves forming each leaflet (Illus. 121). This

Illustration 121

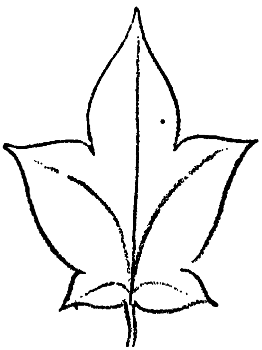


Illustration 122

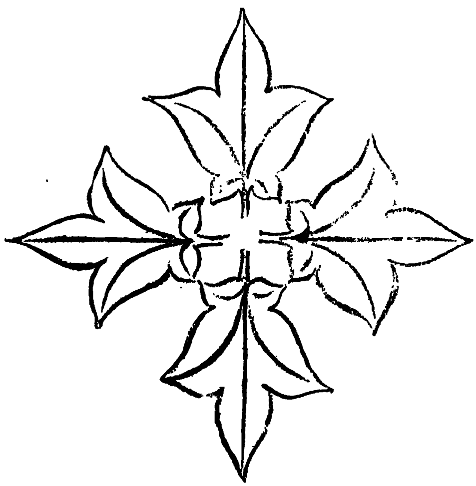


Illustration 123

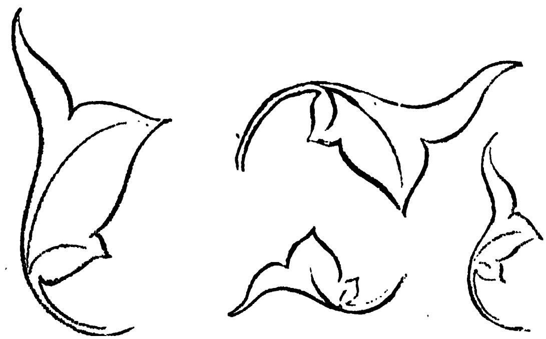
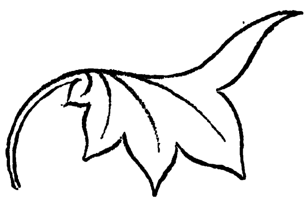


Illustration 124



must be repeatedly practiced till a medium sized leaf of fine proportions is made. Do not let the children practice a very narrow or a very short and thick form. This leaf must also be made easy by repetition, and it can, like the former, be made in four directions (Illus. 122). Let it be about ten inches in length when drawing it on the blackboard and three or four inches in length when drawing it on paper. Reference is continually made to the

measurements that have been found by experience to be the most suitable for school purposes. If the blackboards are of the ordinary size the measurements given are far the best for general purposes. Be careful not to let the children make forms exaggerated in size, or in miniature.

It is more difficult to draw a side view of a leaf, but when facility is acquired it becomes quite easy on account of its not being a balanced form. Let the leaf part be about ten inches in length, draw the large double curve

Illustration 125

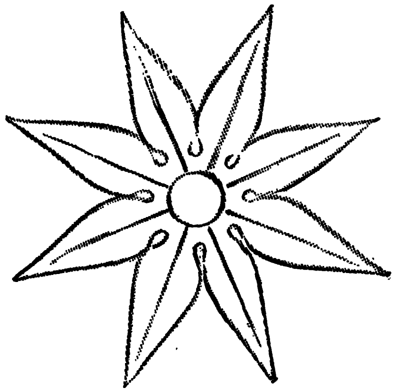


Illustration 126

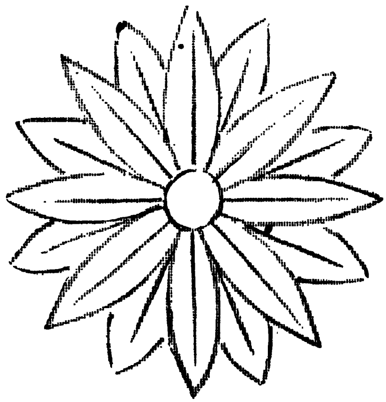


Illustration 127

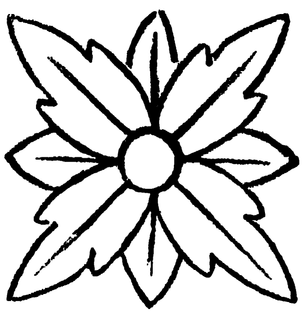
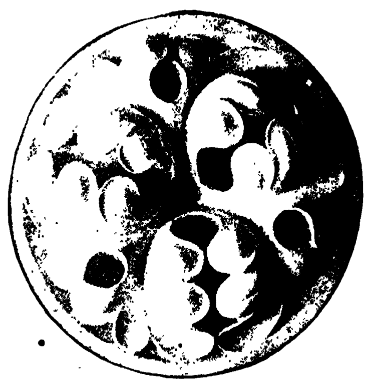


Illustration 128

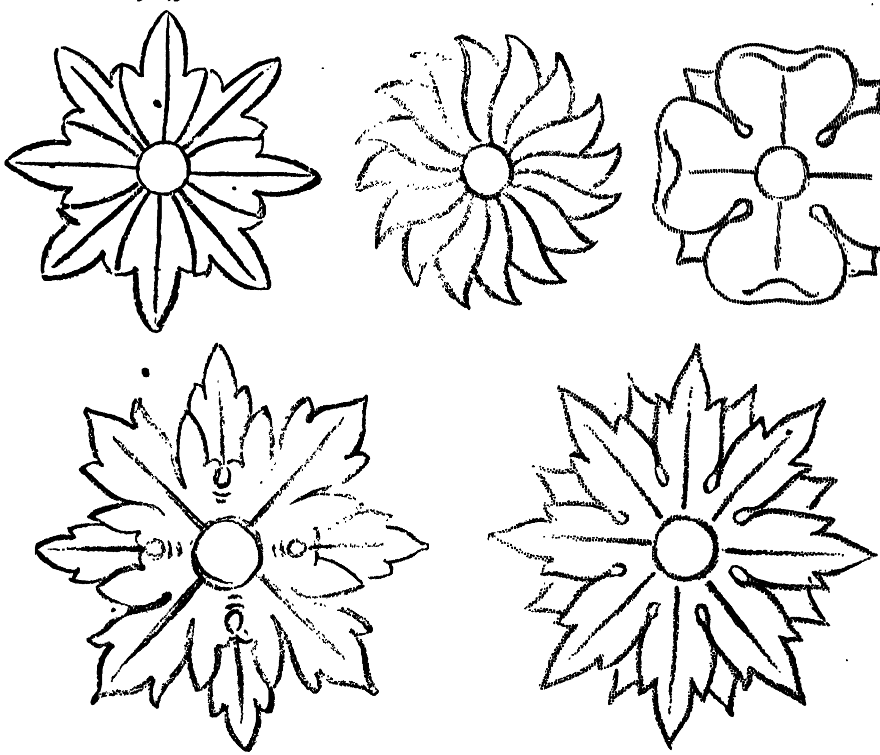


first and then the two ribs. (See 123.) Do not make it look ungraceful or too thick and let the stem be narrow. These are common tendencies in the beginning with all children. The form must be repeated a number of times

to get facility, and then it can be drawn in different directions, balanced, made around the circle, etc.

By this time the double curve should flow from the hands with ease, and therefore much more complex forms may now be attempted, as in Illus.

Illustrations 129-133



124. As many ribs and leaflets as are desired can be put in. Endeavor to get style and beauty in these forms. They can be drawn so as to look very coarse and clumsy, or, on the contrary, to look exceedingly graceful and beautiful. In making these complex leaf forms, get as much variety of proportion as possible; do not let the leaflets be all of the same size. The same with the ribs; let them flow out with gradation and tangential curvature.

Beautiful rosettes can be made by using the leaf curve (see 125). Small points or darts can be placed between each leaflet and an endless variety of such shapes can be made. Make the center boss or ball first, then draw the leaflets out on each side entirely freehand, without construction lines, mak-

ing some of the leaflets with three tips, some with five or more, as shown in the pictures.

Bud Forms can also bé made, and leaf sheaths, consisting of an exterior and interior double curve (see 134). The same forms can then be made with very simple collars (as in Illus. 135), using four, five or six leaflets. Let these little collars appear to embrace the root of the bud first, and do not draw them as though they came out from one side only. Remember that this is delineating the appearance of a solid on a flat surface. It is difficult to make the collar fit in the beginning, but the children soon grasp the idea and make very beautiful ones,—some short and thick, some long and slender. This is called, in its most complex stages, the acanthus leaf bud form. It is simply an ideal bud form.

Another Beautiful Series of Leaves can be made by using the dou-

Illustration 134

Illustration 135

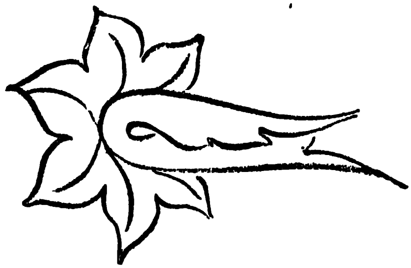
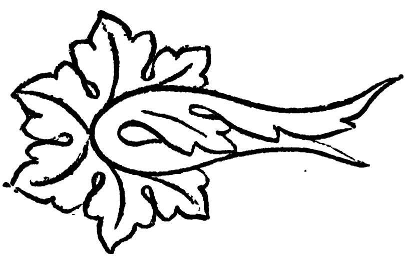
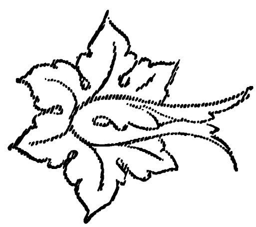


Illustration 136



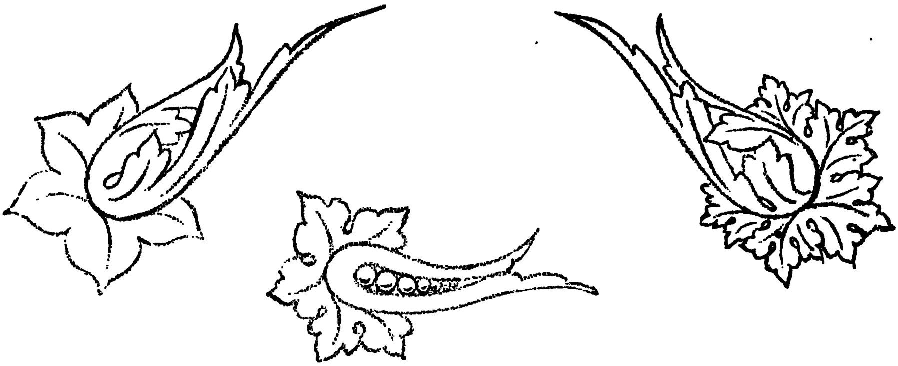
llustration 137



ble curved leaflet as before, but making an "eye" between the leaflets. This change makes it more complex and a little harder to draw successfully, but it is soon conquered. Make the five-pointed leaf and the side view and all

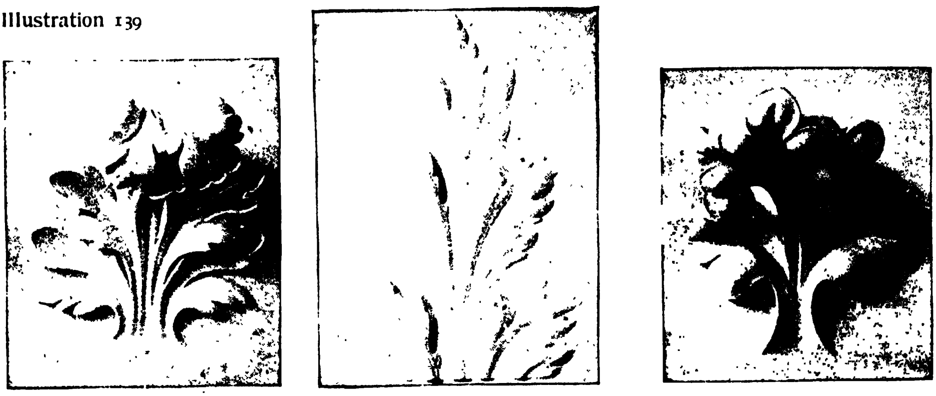
the other forms with the eye, as illustrated in No. 136. The same thing can be done with the bud forms of the last series, always drawing the bud itself first, then the midribs for the collar of leaflets radiating from the bud, and

Illustration 138



the collar of leaflets last. Never, in any of these exercises, allow the children to make the outline first, but let them begin with the ribs forming the skeleton or the framework, and if you once get this right, the detail is an

Illustration 139



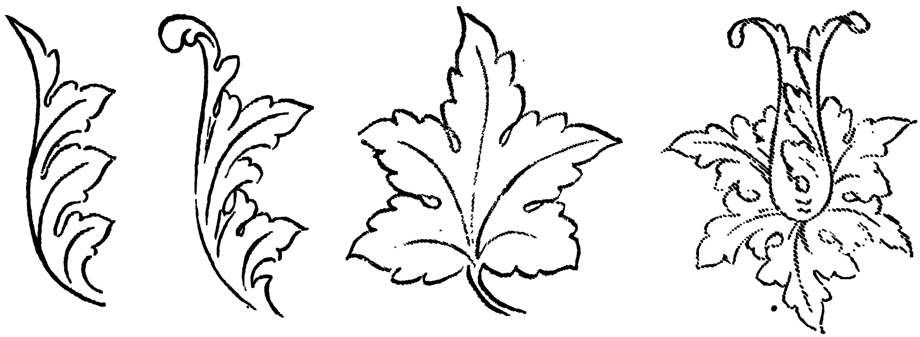
Leaf Forms Modeled in Clay

easy matter. As a result of this practice, the most beautiful and elaborate acanthus leaf buds and foliage can be drawn organically. They will then appear very different from the usual forms given pupils to copy, in which the leaf margins and the forms of the leaves themselves are drawn with meaningless lines, and with notches and points like saw teeth, instead

of the beautiful double curve that we always find in work of the best periods (see Illus. 140-142).

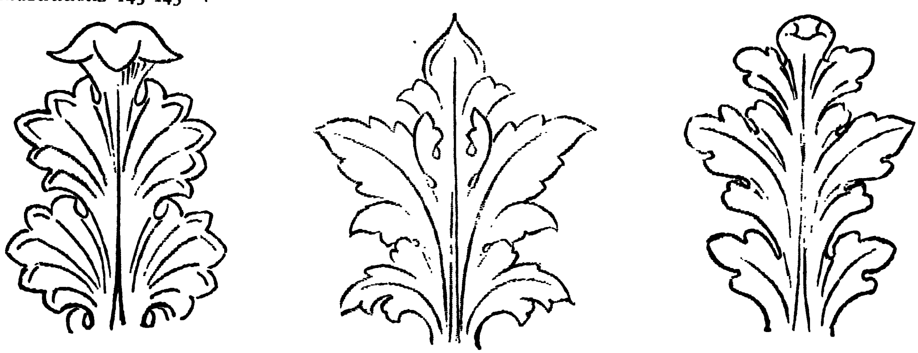
These idealized forms very soon take on the character of the individual drawing them. Just so much balance and proportion and fitness as the pupil has in himself can be embodied in the work of the hand. If there

Illustrations 140-142



is a tendency to make coarse forms, then the pupil must struggle, and by repetition from good copies and good styles, gradually grasp finer forms. I have taken the clumsiest of boys, who seemed to have all their fingers

Illustrations 143-145

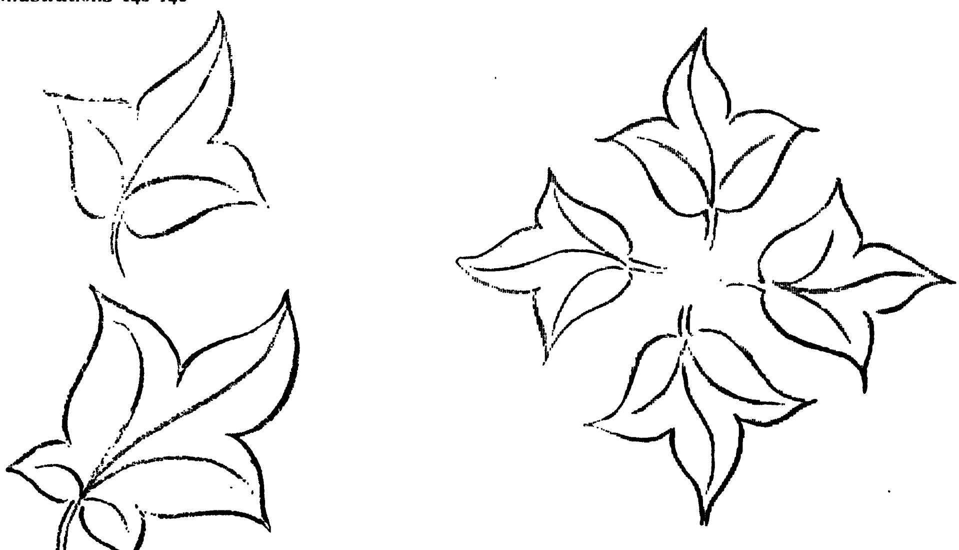


thumbs, and who produced in the beginning thick-set, coarse and clumsy forms without grace, and by giving them special drill on one or two of the most graceful of these forms, I have seen them enabled to draw them with

unusual grace and beauty. To do the work successfully, then, it must be made automatic.

The work at this stage, although good discipline, is not a task, because the pupils take pleasure and joy in their efforts. There is no more pleasant sight than to see eight or ten children swinging with each hand these forms freely and gracefully on large blackboards. Even the beginners soon grasp the spirit and endeavor to do it also. Do not, however, allow the pupils to struggle with the very complex units before they have mastered the simple

Illustrations 146–148



ones, as you will find that they continually wish to do. I am well aware that there are many drawing teachers, and even in some cases artists, who ought to know better, who will say there is not much good in drilling children and requiring them to do work of this character. Usually, however, they will be found to be thoughtless people who have not looked into the laws of mental growth and who do not know the force of habit. The drill is necessary to get the qualities desired, and as long as it is enjoyable, benefit comes to the pupil. I am well aware that the work can be overdone. This is true of any good thing. But I write this simply for the benefit of

teachers who have a little imagination and who will not be tied down to any one set of processes or forms. Ten-minute periods are quite long enough for this practice.

Illustration 149

Illustration 150

Leaf Forms Modeled in Clay

Another series of beautiful leaf forms can be made, using the leaf either with three points or five points, and with and without the eyes, by employing double curves in each midrib. These are much harder, and should not be attempted until the erect or straight leaves have been mastered. The forms can be made around a circle, turned up and down, to the

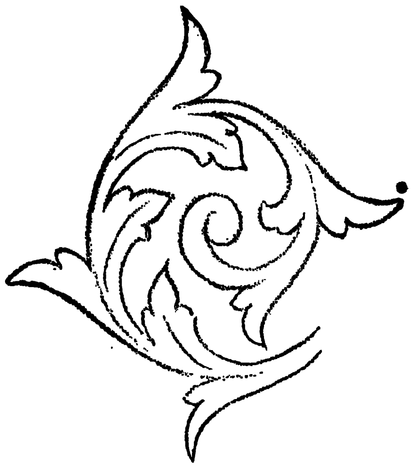
Illustration 151

Illustration 152

Leaf Forms in Design Modeled in Clay

right and the left, as illustrated in No. 146-8. Pupils will in the beginning find that they reverse these double curves frequently in starting any new

form, and that is a sure sign that the curve is not made automatically. It must be practiced with both hands till it is right every time. Just as we have practiced to get facility in making these leaves and a certain good proportion, they should also be practiced to get fitness,—that is, to make them fit different sized spaces and to proportion them to other surroundings with ease and grace. This will not take so long as one would think, when the first stages have been mastered. Designs embodying these forms should be made, first, by simply doubling, then by making fourfold and still more complex arrangements.



Illustrations 153-156

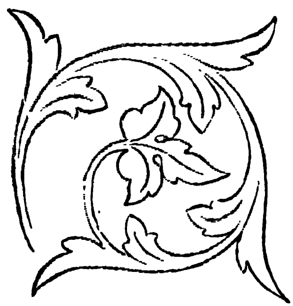
Combinations of Leaf and Scroll.—Practice making this scroll and leaf in a very simple form first (Illus. 153-6). Make the scroll with a single touch, a little crocket inside, and lastly the double curving portion or piece of leaflet. When this has been tried in different directions a number of times, make the same form, adding other curves as with leaflets

Practice making these in different directions quite a number of times. Then the same form can be attempted with more elaboration. Make the leaf portion with several leaflets. These forms will be quite awkward and clumsy in the beginning. It is very hard at first to make them flow out from each other. Let them "grow." Persist in making them with the left hand in the drill work, and in a very short time beautiful conventionalized foliage can be drawn.

The result is very different from the amateur work usually produced by people who attempt to make foliage without having first learned to draw thoroughly and automatically. It is impossible to express growth and tangential curvature and flow of line with complex leaflets and buds in different places, if one has to think of details and the shape of the different portions. That must all be automatic in the hand, the thought being given to the arrangement, the flow and the transition of one form into the other. Only when such freedom is secured do we have *drawing as a mode of expression*, which is very different from imitative drawing, copying a piece and a portion, first "sketching" in with light lines and then "lining in" with others. Our children have plenty of chance to make merry over that kind of drawing.

To replace the scroll any other of the units of design can now be used

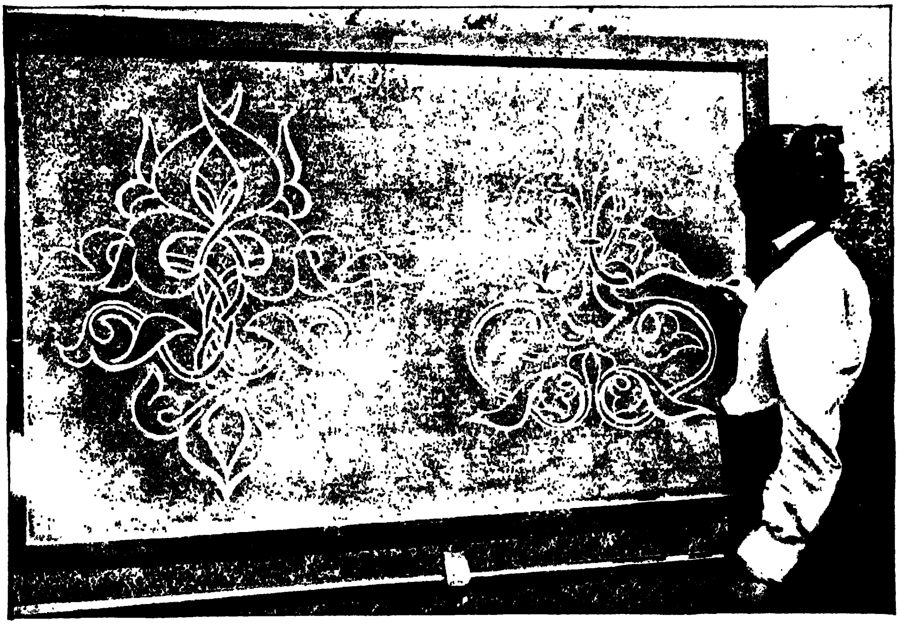
Illustrations 157-158



with the leaflet in endless combinations, paying attention, of course, to fine arrangement, to flow of line and to beauty. Space will not allow me to illustrate a fraction of all the combinations that can be made, though I should like to suggest a few. These forms can readily be seen in the illus-

trations of pupils drawing on blackboards, in different parts of the book. To make combinations of these forms is one of the usual drill exercises in all our schools, the children stepping up to the blackboard in rows and each one making different patterns, that are elaborate and graceful according to the amount of practice they have had. Children starting with this work at the regular primary age can readily do as good work as is here illustrated by the time they are about ten years of age.

Illustration 159



Moresque Designs

These forms are quite difficult to make flowing and graceful. The single units must be thoroughly memorized before successful designs can be made. Fine arrangements of these can be made with brilliant colors.

The Moorish Units.—Another very good unit for practice is the Moresque unit. This is much more difficult to make automatic than appears from its simple form. Make the large double curve on the outer part of the unit first. (See Illus. 160.) Then swing in the double curve

from the point so that if prolonged it would flow from the stem and the two short curves, diminishing in breadth toward the stem.

This form must be drawn with a single touch for each line. It is an ideal form, and perhaps next to the Greek form is one of the most beautiful in the whole range of design. Make the unit short and thick, or long and slender, but always with a narrow stem. It is quite difficult for the pupils to resist making a scroll instead of a point on the short blade, as indicated in Figure 162. Point out to the class the two blades, a long double curving blade and a short thick curving blade. Time must be given to this form, and after a good deal of practice it can be doubled. Practice drawing it singly and doubled in all directions around the circle.

The next unit (Illus. 163), also Moresque, is likewise good for practice. This is much more easy than the preceding form, although it looks more

Illustration 160

Illustration 161

Illustration 162

Illustration 163

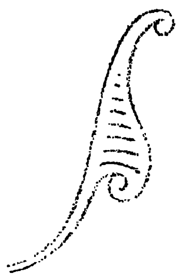


Illustration 164

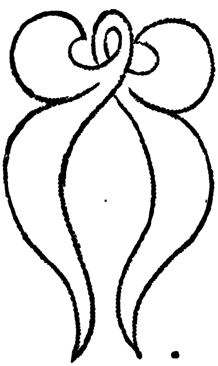


Illustration 165

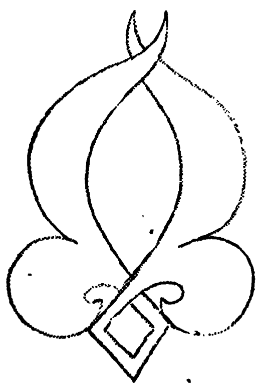
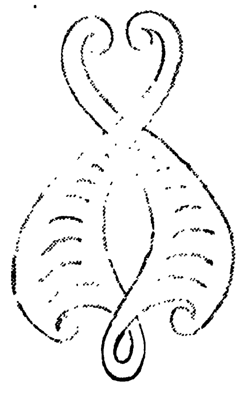
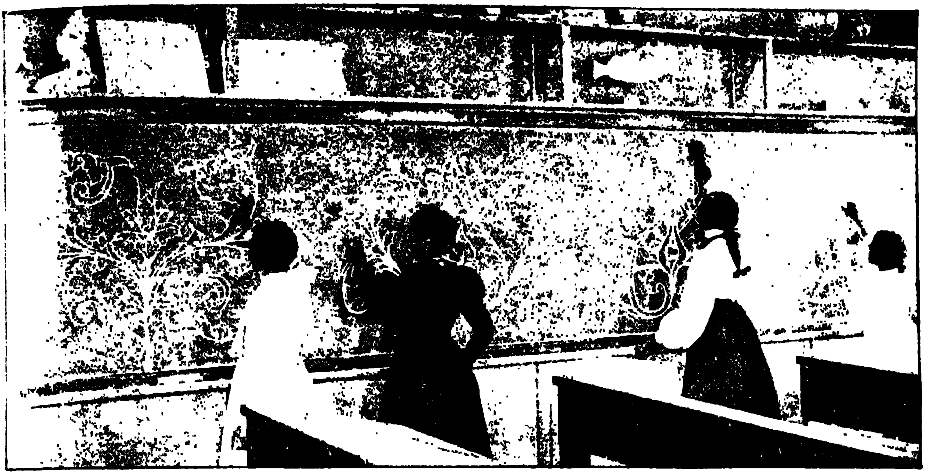


Illustration 166



complex. Make the outer curve swinging to the top scroll, and then a double curve to the second scroll and then a long, slender stem. This must also be practiced in many directions. Be careful to space markings equally and parallel. In combination with the other form given, beautiful Moresque patterns may also be made. Great care should be exercised in spacing out these forms and in interlacing them, otherwise the product will be poor. Simple arrangements are best in the beginning. Each of these forms doubled can be used for drill work on the blackboard, a few of which are illustrated in No. 159.

Illustration 169



Colored Pupils from Public Schools
These children have been instructed by their own school teacher, in drawing and modeling.

CHAPTER V

Drill Forms and Designs.

A COMPLEX EXERCISE and one requiring a certain amount of dexterity is to combine circles, making different figures. Do not allow the pupils to make these exercises until they are expert with the single circle. Make the following exercise (Illus. 171) by drawing first one circle and repeating the line by swinging the hand on it several times to memorize the size and proportion, then swing the hand to the second position, making the circle as near as possible the same size, and then to the third position. If it is properly drawn, it ought to make a complete circle inclosing three equal circles, equally interlaced.

This is a good exercise for the judgment and to fit the forms. When the three-sided center piece is made of equal curves, equi-distant, and the next space is even and equal, and so on to the inclosing circle, it shows great accuracy. I shall repeat again that we must not expect accuracy in the

beginning. Facility first and then accuracy. This is a statement that I shall make continually. Measured accuracy, of course, is not required.

The greatest artist that ever lived could not perform these simple exercises absolutely true, but ordinary people can perform them to a degree,

Illustration 170

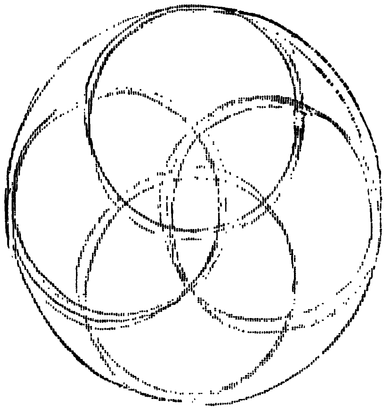


Illustration 171

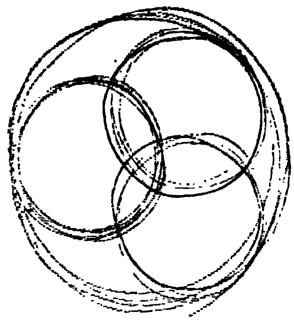
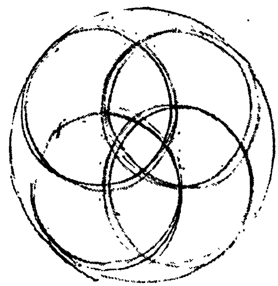


Illustration 172

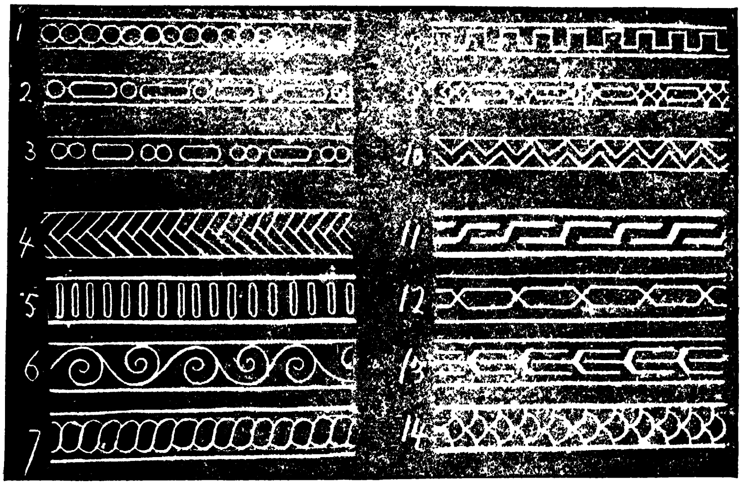


showing very good proportion, fitness, and so on. If a large class is drawing the same exercises, it is very rare that one or two do not fail to show remarkable facility and exactness in doing these things. Some have facility and accuracy almost organic or automatic in the beginning; others seem to entirely lack these qualities, and it seems as if they could never acquire them.

Borders make a very good series of exercises for practice and drill work. The pupils can begin with the simplest frets (like 173). Make these forms entirely freehand, straight across the blackboard or paper, from end to end. Do not mind if they are not accurate in the beginning. The tendency with everybody at first is to make them diminish in size. Resist this and keep up the practice, and very soon the border can be made with straightness and the other required qualities. Make a number of forms similar to the border, using straight lines, as illustrated. Then a series can be

made, using a combination of the horizontal and the oblique line. A number of elements are used in borders. The pupils can begin, say with the simple frets, using straight lines, then a simple elementary plait, the zigzag, the beads, and other complex ones. The wave, the scroll, and the spiral will make a beautiful series of borders, and all the different units of design can be used in it. The scroll and crocket, the leaf, the Moresque unit, the Greek form, etc., can be used for the same purpose, as partially suggested in the accompanying sketches.

Illustration 173

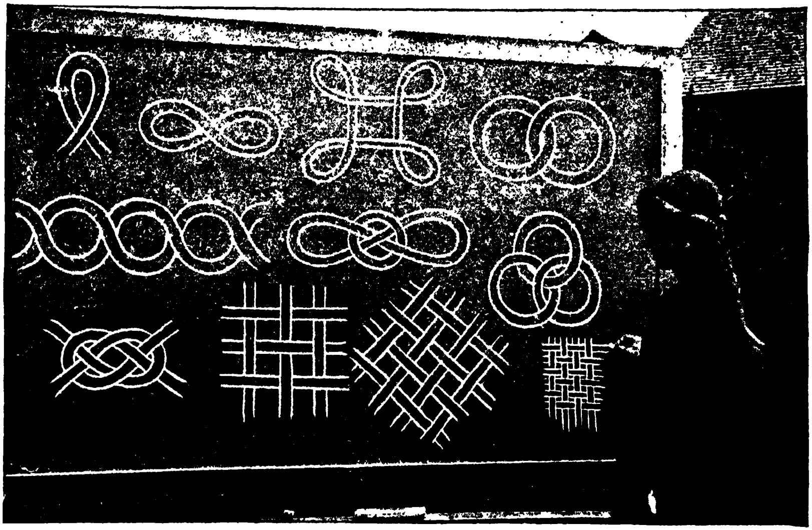


Exercise in Drawing Borders

Borders of many styles can be drawn and memorized by repetition. All the good common borders seen in wood, metal and stonework should become familiar to the pupils. It is excellent practice to draw them entirely freehand across the board, also on paper and slates. This compels a great deal of accuracy.

Endeavor to have the children vary these forms and make the same units of different proportions. Beautiful borders can be made with the Greek forms, introducing the anthemion. Then there is a series of Celtic frets, Arabian frets, Moresque, Chinese, and so on. It is quite important that pupils should understand the meanings of some of these ornaments, this enabling them to enjoy the ornaments more thoroughly. Very few of the wonderful patterns seen sometimes on barbaric ornament fail to contain or symbolize certain things.

Illustration 174



Strap Work

To make these forms interlace and balance without erasing lines or marking off the dimensions, compels attention and is valuable manual training. Very elaborate work, strap work and complex frets, etc., may be drawn for practice this way.

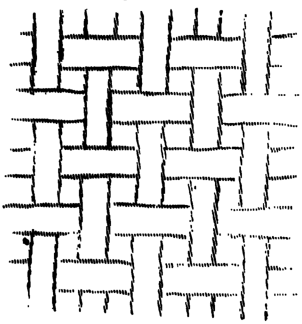
Exercises to Compel Accuracy.—The little exercises here given are to compel the hand to attention. I begin with a simple form, the loop (shown at 174). The object is to enable the hand to make the loop stand erect and to interlace the band at once, freehand, without crossing. To make the double loop is a little more difficult. To make it so that it is equal on both sides at first is almost an impossibility. But notice that when the form is repeated a few times the hand gradually becomes accustomed to it, and makes it in better shape; and after a few repetitions the power to get the form interlaced and at the same time drawn correctly is unconsciously applied or becomes automatic. Do this with the loops fourfold as above. Next try the band (Illus. 174), making all the links equal in size and each band interlaced with others at regular intervals. To do this at first without raising the pencil except at the required places, compels attention and a certain amount of thought and care that is beneficial. Next, try the

orm of two rings interlaced. The lines are to be drawn at once without cutting each other, and the rings should be quite evenly drawn. This must be repeated many times. Then the same thing can be done with three rings interlaced.

The next exercise is to draw a band interlacing the ring (Illus. 174). Remember, it is required that these forms should interlace without cutting and without lifting the pencil except at the proper stops. The work requires continued thought and trouble in the beginning, but can be done quite swiftly and with a great deal of accuracy after practice. This is a thing to be desired and helps exceedingly in a variety of places in drawing. It makes the hand obey the thought in certain places with rapidity. Do not mind how crooked the forms are in the beginning, or how many errors are made. Persist with the work till it can be done with ease and accuracy. A good return will be had for the trouble taken.

Interlacing work of several kinds can also be attempted. To make this so that each band is of the right length without cutting the wrong band, requires a certain amount of dexterity and neatness that is much to be desired, and is difficult to get. Remember, the hand is to practice this till it can do it automatically. This seems impossible at first, but it has only to be repeated till the hand and the mind are thoroughly familiar with what is required, when it can be done readily with great ease. The size of the mesh can be changed. It is a good plan to try strap work of different kinds like this and other patterns.

Illustration 175



These exercises are especially good for students who are inclined to be a little careless or slovenly in their work. It is especially good for those who are not careful in the beginning, and expect to come back at some future time and make things better, when it might be done right at the start. It is also excellent discipline, and is useful for adults for practice when they require to be braced up a little or do not have energy sufficient for more important things.

Drill Work.—Throughout this period of our work I attach much importance to drill. I want lines to be drawn automatically. I want them

to be made with single sweeping touches. A curve is something very different from a bent line. The more sweep and swing you can obtain, the better the curve will be. We should be able to swing curves of any size and gradation automatically with a single movement. We cannot imitate a true curve or spiral by patches and short touches. This is the reason the drill forms are so continually emphasized and that I wish you to practice the sweep and the swing over and over again, until you can make good spirals, double curves, circles and ellipses.

The ellipse is the most beautiful of all geometric forms and one of the most useful in design. It is even more beautiful than a circle, because it has the qualities of the circle combined with variety of curve. Practice to make the ellipse automatic by means of the following exercises. In swinging this form (Illus. 176), do not endeavor to follow the same line. Swing about in different places. Facility first and then accuracy. This is a good exercise, because it compels balance. Both sides of the ellipse must be symmetrical. When facility is acquired with the one form, practice it in combination (Illus. 177), as in the preceding exercises. It is also good to make long and narrow ellipses, short and thick ones, to be able to make the hand obey automatically the mind in response to the desire. We should be able to put down in drawing all these forms in the proportions desired without an instant's hesitation. That is what I mean when I say that proportion must be made organic, just as we endeavor to make balance, facility and fitness organic.

Illustration 176

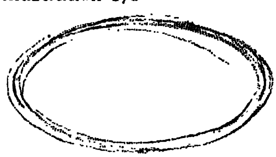
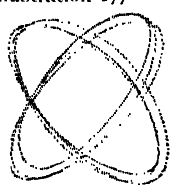
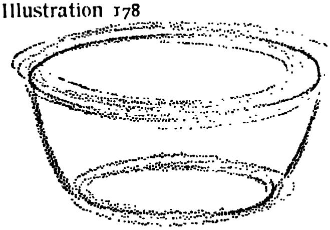


Illustration 177



When this can be done it is very good practice to make a series of vessel forms. Let the form be simple in the beginning, like 178 for instance. There is no exercise that will give the children the idea of a solid, the complex solid, in different positions, more quickly than this. The making of simple saucer or bowl-shaped forms must become automatic. One must practice with them till the form is symmetrical and stands properly. It can be made deeper or wider, and different sizes can be

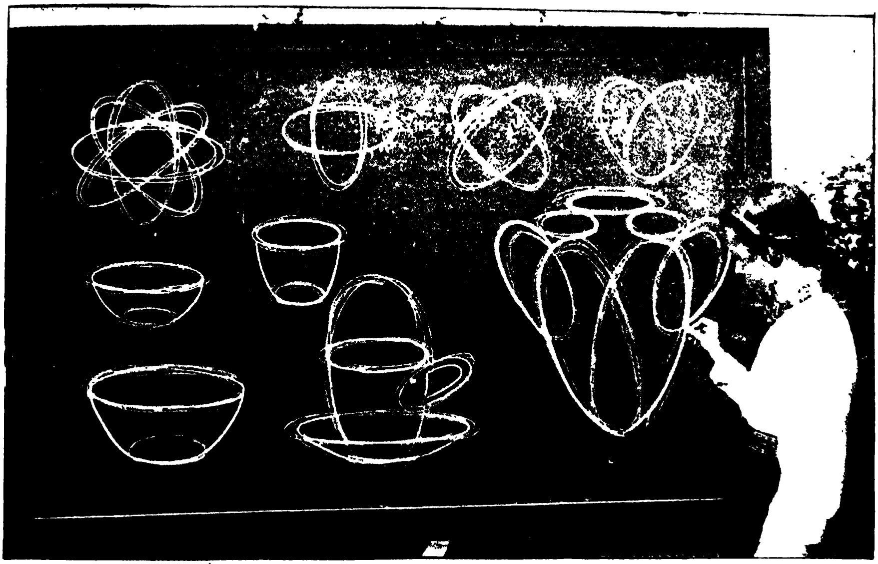
Illustration 178



made so graduated as to indicate the whole gradation from a straight line to a circle, as observed in different relations to the eye.

Practice with these curves will enable one to get very accurate balance in these vessel-shaped forms, and the children can also do it. Of course,

Illustration 179



Drill for Magnitudes

This picture shows pupils memorizing magnitudes and making solids. The ellipses must be swung with free continuous touches until the balance and size of form is felt. Various cylindrical forms should be drawn as cylinders, cones, circular plinths, etc.

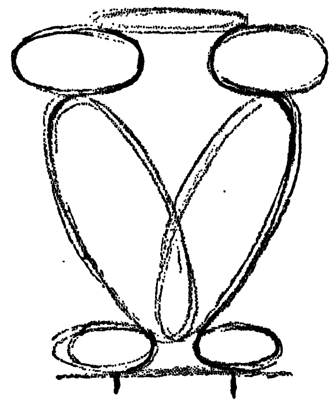
in the beginning the vessels will seem a little bent or crude, but they will look like solids, like vessel-forms, containing cavities. In teaching delineation, this is quite an essential point to make children realize. It is quite difficult by the old way to make some children, and even adults, realize that the movements or touches they are making are the visible representation of something in their minds. Usually they look at the marks on the paper or the board as they make them, disassociated from the mental image of the thing they want to represent. They look at the pencil lines or chalk marks as the diagram in itself, and begin to work with that, modifying and changing, instead of keeping to the original mental image, and making the hand follow that form.

It is not easy to make my meaning clear by means of printed words, but if one will practice with this form, and at the same time think of the saucers and dishes being solids, the hand will very soon grasp the feeling that it is delineating something tangible and concrete, not simply making pencil or chalk lines. This association is strictly necessary in drawing. We want to make the connection between the eye and the hand machine-like, automatic. We want to make one obey the other without thought, and the more we encourage this capacity the better the drawing will be. All kinds of cylindrical forms can be made, cylinders of various sizes, circular plinths of different sizes and the like.

It is a very good exercise when the children have acquired facility in this way to make a cup and saucer. (See Illus. 179.) Every line in this cup and saucer can be made accurately by means of swinging the ellipse in different directions, and it can be put in very accurate perspective. It is quite difficult to make the cup fit the saucer in the beginning. It is good practice also to make different sizes of cups and saucers fit each other.

I believe this principle was understood by the Greeks. Certainly their vessel forms of all kinds conform to it. Almost every Greek vessel can be drawn by a series of these curves. In the simple vase form with handles, illustrated in No. 179, page 127, every line is made without any trouble, and very good balance can be obtained if the ellipses are even. Of course this cannot be expected until the ellipse is made automatically, but when that facility is once obtained, beautiful, balanced vessel forms of all sizes and shapes can be produced with a few touches. It is very good drill, when the children are practicing, to have them make new vessel shapes, using the principle. Do not let it be overdone. Keep the forms simple and beautiful.

Illustration 180

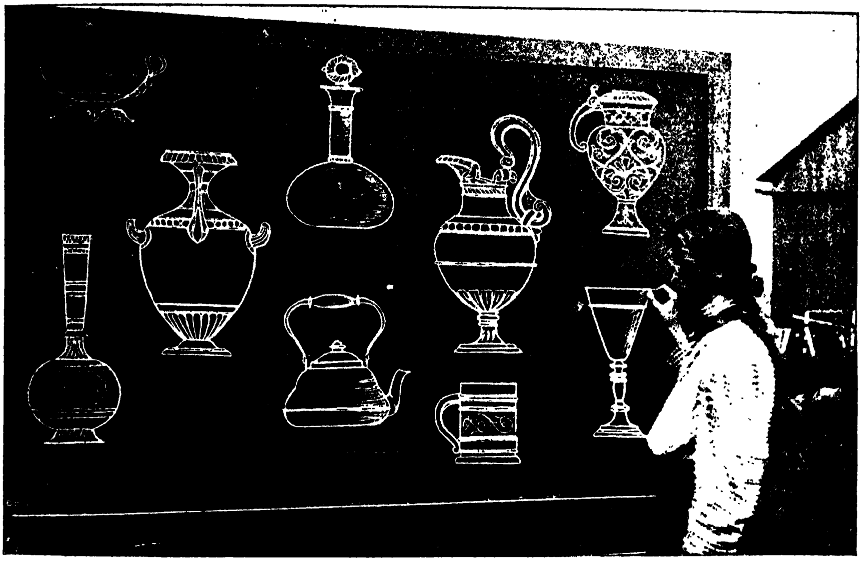


The transition of curve into curve can be studied while producing this vase. Some of the most beautiful Greek moldings conform to this principle. Usually, the more gradual the transition from curve to curve is made, the better the result. I repeat that this is useful in enabling one to make the two sides of a complex-shaped curved figure of any kind, in wood,

stone or metal. It is easy to bring the concrete ellipse to any proportion and then to repeat that in any position. I have never known any one taught in the old way able, in drawing a vase form, to make the balanced line down the other side of the complex form. They can very seldom get the two sides alike, and never with a single line.

It is one of the most tiresome of the drawing exercises usually given to children in schools,—to make the two sides of a vase, and I have even

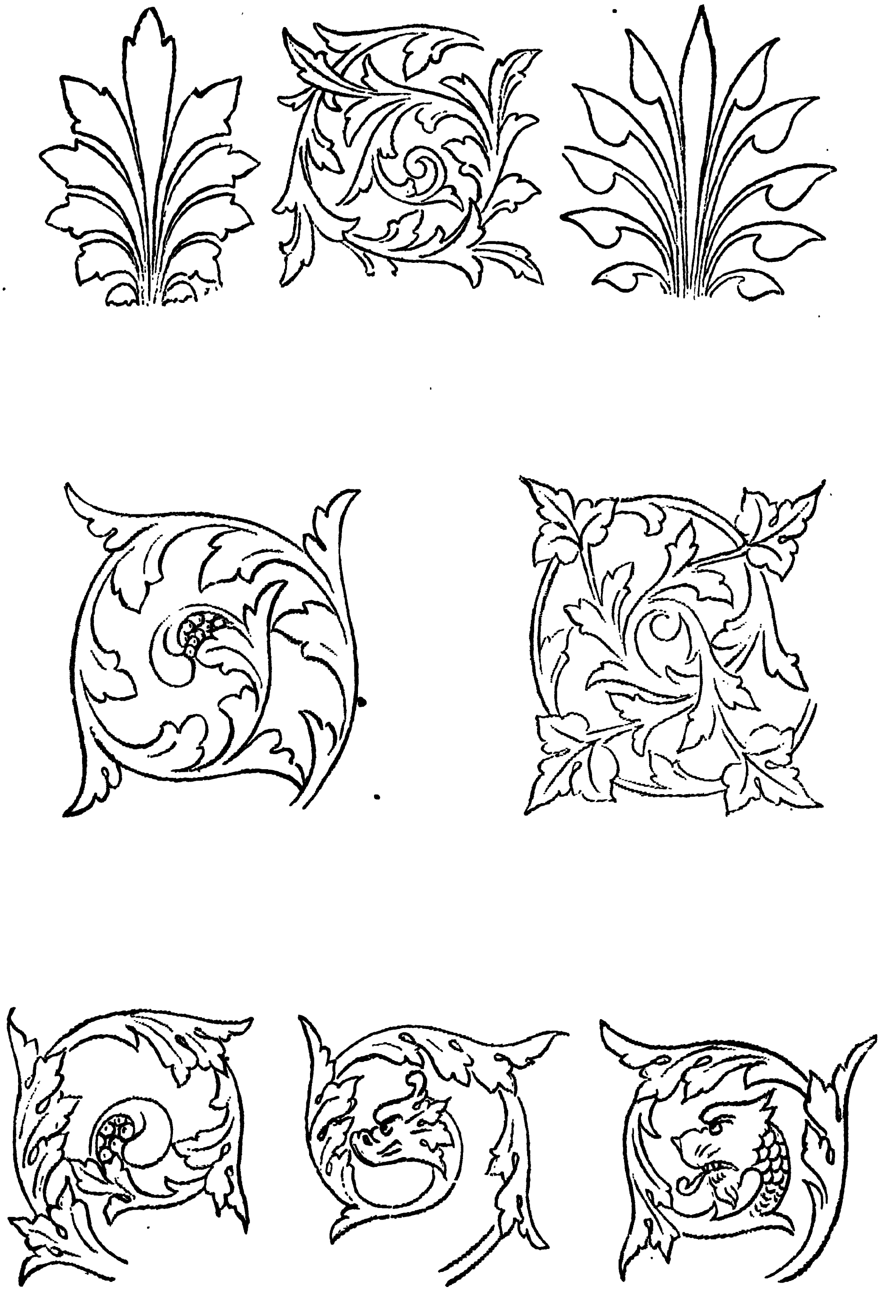
Illustration 181



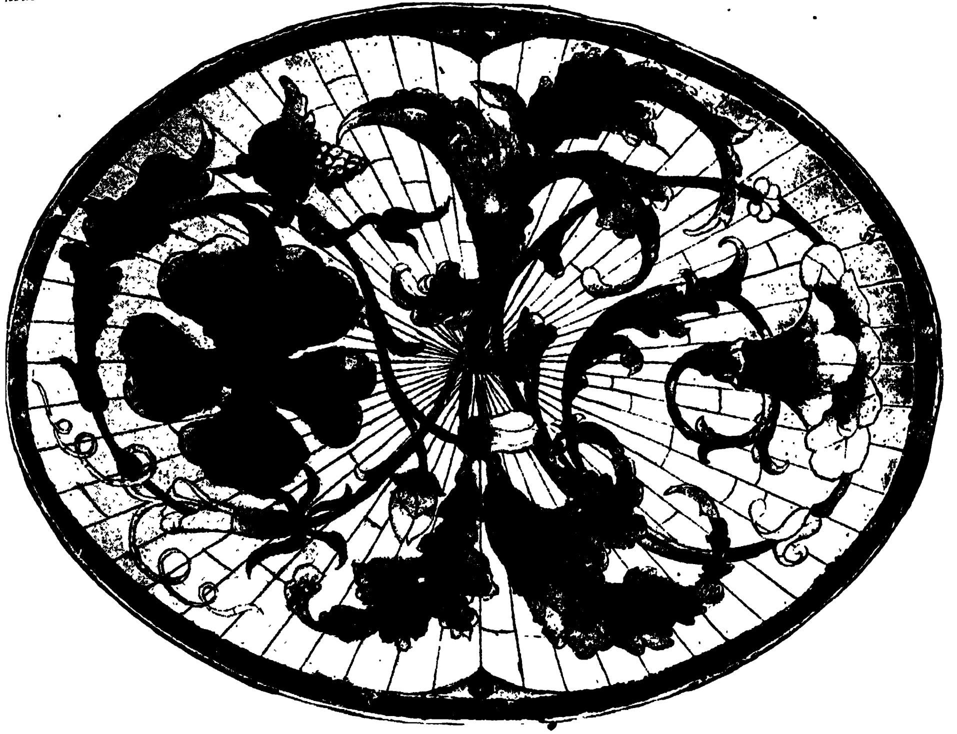
Diagrams (or Section Views) of Vessel Forms for Designing Upon
Some of these shapes are copied and modified. The good forms are memorized and original designing is attempted. The balanced curves of these forms have been made by swinging the ellipse lightly and then erasing the unnecessary lines.

seen the vase form cut out on paper and pasted on the wall, for them to copy, as though that would make it more easy. Magnitudes must be grasped mentally before they can be delineated, and to do this, power to make magnitude must be made automatic by proper exercises. It is foolish to expect a child to put down a complex magnitude by imitation at the first attempt. It is invariably exaggerated in size, and little profit results to the pupil. The eye and the hand must take in proportion by repetition of various sizes consciously assimilated (Illus. 181).

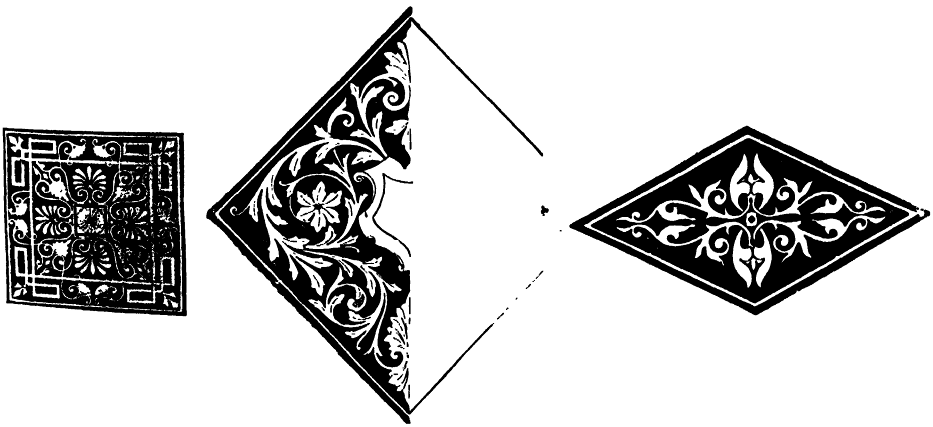
Work in Design.—When the children have had a little practice



Illustrations 190-193



Design, in Several Colors, for Stained Glass Window
Made by a pupil in the Manual-Training classes of the New York Young Women's Christian Association.
The fine color-qualities cannot be perceived in this reproduction.



Designs by Public School Children
The center cut is unfinished. These designs are made in various colors for different purposes.
The forms are made entirely freehand.

in drawing the units of design on paper, as well as the drill forms on paper and blackboards, they can begin to make designs. See various illustrations of original designs by children and teachers on pages 66 and 130, also scattered throughout the work.

In some of my classes I allow the use of the ruler, making straight lines and marking out the sizes of the space that the pattern is to occupy. In other classes they have to do not only this, but the drawing of the straight lines entirely freehand, according to the amount of discipline which it is desired to give them. If they are very young, or perhaps mixed classes in the night school or mixed classes of beginners, it is advisable to give them the ruler to help them. If they are pupils who have had thorough training and the right elements of drawing, and have a certain amount of good hand and eye power, like the grammar grades of children who have had this training from the beginning, they can readily make their entire patterns freehand, drawing all the lines without the use of a straight edge or ruler, not measuring distances, and making all circles without callipers. It is good sometimes to give the ruler to pupils to test or judge the amount of proportion they have made, if you can depend on their not making the actual forms with it. This is a question for the individual judgment of the teacher. Some classes of pupils, of course, will cheat and use the ruler, others will do as is required.

Color and Brush Work.—When designs are finished to the teacher's satisfaction with a pencil, it is a good plan to allow the pupil to paint the background or the design, whichever is best, in black ink. If it is a matter of economy, say in the night schools or rural schools, common jet black ink can be used, with a round pointed brush, with hairs about half an inch in length,—Nos. 4 and 5. If the best results are wanted, allow the pupils to paint the pattern with India ink, or Higgins's black ink, or preparations of that kind. This throws out the design and enables one to see the full effect, besides affording the pupil the opportunity to use another tool, the brush.

It is quite important to get good brush handling, and in this elementary brush work you should endeavor to get the children to make free, clean touches with the brush (Illus. 194). Practice making some of the forms large, and some small; try to swing the brush freely, without resting the hand or arm. The most beautiful flowing lines and forms can be made this

way. At first, the forms will be very crude, but to be of value the forms *must* be made freely without help. Do not allow them to pick out the shape with little patches. Endeavor to get them as much as possible to draw with the brush. Very little practice will enable one to grasp the best mode of handling the brush. There is no better way than the Japanese method of

Illustration 194

Freehand Brush Play is Good Practice

in making various forms and also backgrounds in color. The pupils must endeavor to make the forms with as few touches as possible. Try to draw with the brush, also to do it without supporting the hand in any way. Much of the best Greek and Japanese work has been painted freehand. Grasp the brush sometimes in the hand like a pen, sometimes by the tip of the handle.

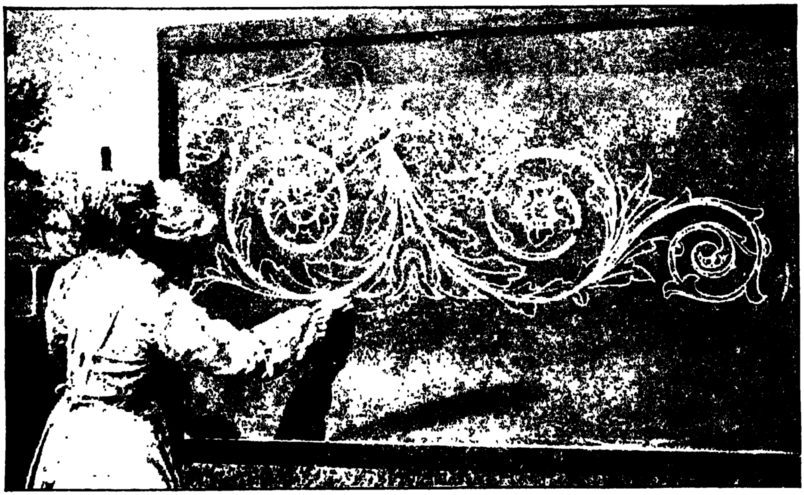
working, where the entire forms are made by brush work. The patterns can also be painted in monochrome, in one or two shades of the same color, as sepia or terra cotta; and later on two, three and four shades of different colors.

From the beginning the best pupils should be allowed to use white paper and should be given water colors. If it is a matter of economy, cheap colors can be purchased that are very good for this purpose, as low as fifteen cents a box. For ordinary school purposes, however, it is still

better to use the regular water-color paints. They last a long time, and five or six boxes will answer the demands of a large number of designers.

Blackboard Work. —Class instruction at the blackboard is shown in elementary stages for grammar grade pupils in illustrations 41, 42, 43, and 45. These pictures are from photographs taken in one of the public schools in Philadelphia. The teacher has about 60 pupils, and all receive this instruction in turn. The four pictures simply show a series of stages from the simple circle to elementary designing. No. 41 represents the children making the first exercise, the circle, which is usually drawn,

Illustration 195



Freehand Designing

Allow pupils to draw bold and free flowing arrangements as large as possible, making the curves with swinging lines. This is open air work on blackboard, made by a member of my summer school in the Adirondacks.

as described before, in six different ways. The second picture (page 69) illustrates the children drawing the scroll form doubled with each hand, the beginning of a pattern. The third (43) illustrates the pupils drawing the anthemion four different ways, the hands being placed for the purposes of illustration in the different positions. The fourth picture (No. 44) represents the children drawing designs. These pictures were made on the same day and the visit was unexpected. I

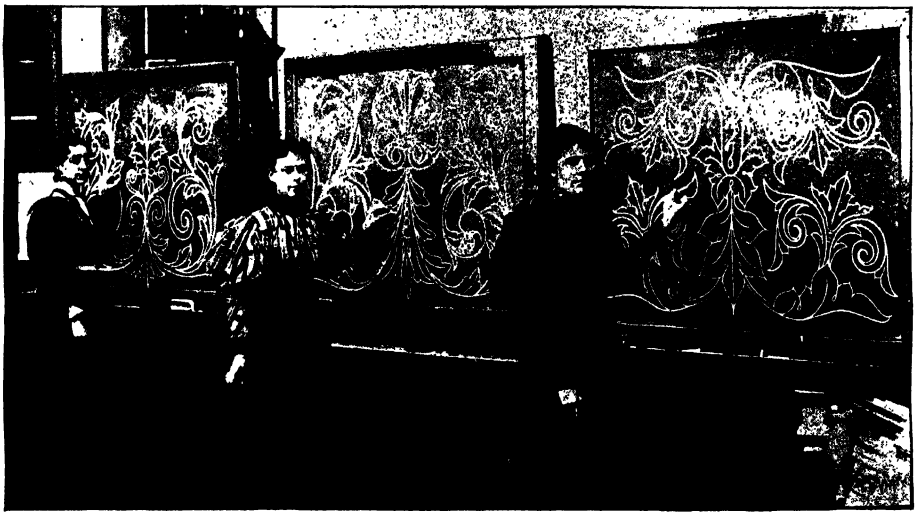
made the pictures myself, but had never been in the building before, so that the test was a fairly good one.

Under each stage represented there is a very large series of forms in which the children are drilled. Of course it is not possible to represent each one, though I should like to do it. The children are called up in rows, two or three to a board, there being four blackboards in the front of the classroom. In some schools there are blackboards around two sides of the wall, which will allow more pupils to be drilled at the same time. I find some teachers can, by thus dividing the class, give very conveniently a good lesson in blackboard-drawing to a large class in 20 or 30 minutes, every pupil working in turn on the blackboard.

The wise teacher will modify the suggestions offered here to suit her own environment. It is advisable for the pupils not working on the blackboard to observe closely those who are drawing, the teacher calling especial attention to faults in position, or to particularly good results; then if convenient, or at other times, the pupils at the desks can draw the same forms on their slates or paper, as preferred. It would appear from the pictures that these children are too close to their work, almost as though their faces were touching the blackboard. This, however, is not the case. The effect is produced simply because the camera had to be placed behind the children. You will find that some are almost at arm's length from the designs. There is a tendency with little children to stand too close to the board. Resist this as much as possible. Let the work be bold and free.

Designing on Blackboards.— When the pupils have become able to make the elementary forms and units of design without any trouble, and have gained a certain amount of automatic balance, proportion and fitness, it is desirable that they should take up a course of designing on the blackboard, it being one of the best possible surfaces for doing good or advanced work. I recommend, if the classes are not too large, that one pupil work on each blackboard, or at least have a space 3x4 feet; 4x5 feet is still better. This makes a splendid surface for a single pattern. It is advisable that the designs be made as large as possible, and that both hands be used.

Notice the illustrations herewith, page 136. This is part of a blackboard-drawing class. For convenience, I have shown the same teachers drawing two different patterns. It will be noticed that each pattern is different, that the scroll, anthemion, leaf form, shell form and



Blackboard Designing and Drill

These designs have been made by teachers of the public schools, members of the teachers' classes, Public School of Industrial Art, Philadelphia. The forms are memorized but the arrangement is original, and is drawn without erasure until the entire pattern is finished. Both hands are used, the left hand for the left side and the right hand for the right side. See page 135. Work like the above is done in about 4 to 6 minutes usually.

Moresque form are used. The teachers are using the left hands in every case illustrated. This is simply to emphasize the desirability of using the left hand, for reasons advocated in First Principles.

It is best for the pupils to make the center of the pattern first, being sure that they find the middle of the board. It is not necessary to draw a line, as is done in some cases, down the middle of the board. They must be able to feel the middle. The center parts can be drawn with both hands at once when they are symmetrical. If the pupils have had proper drill in the elementary stages, this will be quite easy. Then the rest of the pattern can be put in position. From the beginning, emphasize the desirability of firm lines made with clear and swinging touches. Endeavor to erase as little as possible. Of course when the pattern must be modified and changed, the eraser may be used, but refrain as much as possible from altering every little part.

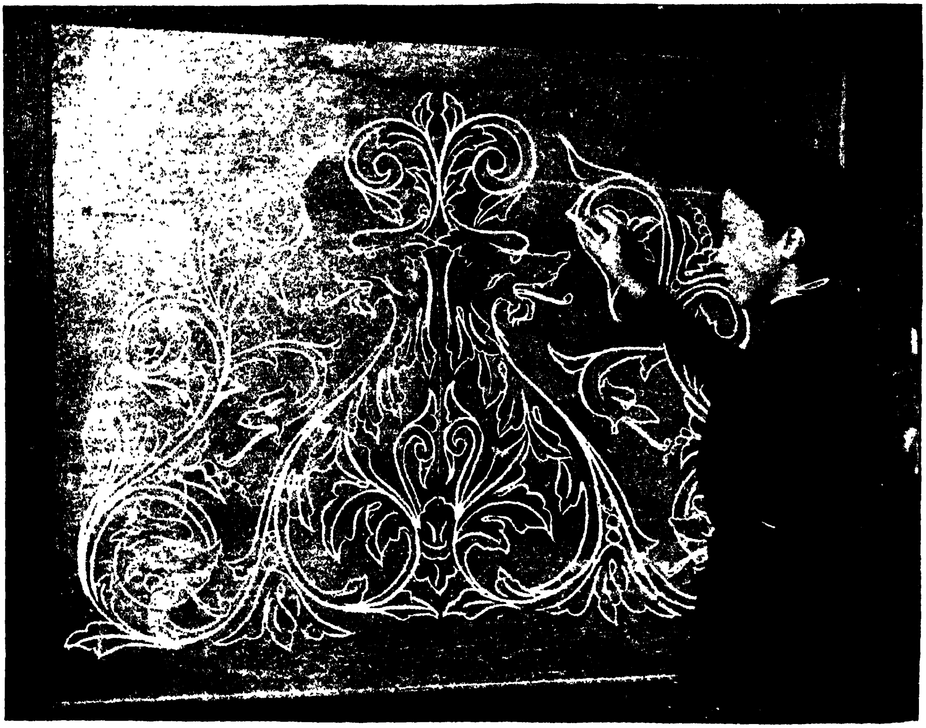
Try to see the form as a whole before making it. A good designer can always do this; a bad designer is one who makes it up as he goes along, putting things here and there by chance, if they happen to look well. It is much better to be able vividly to form the concept of what is desired, and then to put it down complete, with a few firm touches. The teacher can very soon distinguish the pupils who are drawing this way, with a complete concept in mind, from those who are "making up" as they go along. Lack of clear thought shows in the hesitating movements, which betray lack of confidence. I can also distinguish this class of work in finished designs.

It is a little difficult to cover the whole surface of the board with judgment, good balance, etc., but it is good discipline, and can be done just as readily as if the pattern were very small, and gives much greater dexterity. Patterns drawn this way in the beginning will sometimes be very poor in composition and sometimes be too large or too small in parts. The object of the teacher should be to rectify, as much as possible, this fault. The moment the pupil steps back, errors of this kind can be perceived and rectified. It is better to hammer at one pattern several times than to try making a number of different ones, letting each one have an entirely different character. Modify one pattern till it becomes very much better,—till teacher and pupil are alike satisfied with it,—then attempt another.

This practice should be continued till the forms of any style can be

varied endlessly at will. Very soon, when pupils arrive at the stage illustrated, there will be a desire to introduce still more complex forms in the design, such as dolphins, griffins, grotesques, and other decorative forms. This should be encouraged in moderation, and attention should be given to the form used. It should not be used unless the pupil is thoroughly familiar with it. From the beginning, see that the patterns are made for some purpose. Do not let the drawings be meaningless patterns on the blackboard, without any intention. Of course there is practice in this, but from the beginning the pupil should firmly keep in mind what the pattern is for,—whether it is to be used for wood, or for stone carving or fabrics, etc., and as much as possible it should be rendered so as to be fit and appropriate for use in those materials.

Illustrat on 198



Free Hand Design with Griffins

Do not let pupils use any complex form in designing until it is thoroughly memorized. This pattern has been drawn in six minutes, without removing the hand until finished. The left side was drawn with the left hand first, then the right side drawn in proper balance with the right hand.

Drawing from Life

CHAPTER VI

Drawing From Life Forms and Memory Drawing

THIS IS AN IMPORTANT PHASE of our work, and one that must be emphasized by the teachers, all the time, if they desire to get good results from the pupils. Pupils should be encouraged to draw from living forms as much as possible. A few illustrations herewith will serve to explain my meaning. Notice the picture of the girl drawing chickens. The chicken is moving about in a coop. At first the results produced are very depressing. The bird will not keep still, the pupil complains. With a little practice, however, it will be found that it is not necessary that the chicken should keep still; that its shape can be observed even when it is moving about. Notice that the girl has drawn the same chicken in five different positions,—a side view that

was drawn first; the chicken eating corn; a front view of the chicken looking up; the chicken seated; and the chicken holding up its head.

If the pupil will persist in making a few of these diagrams without minding how crude they are in the beginning, in a very short time it will be noticed that the hand and the mind become more familiar with the form, and that although the drawings are very rough, they will become successsively a little better. A little more power will be registered in the mind and hand by means of each diagram made, and by degrees the hand will become more obedient. The feet will not be made too large or small, the bill will become of the right proportion, and the tail will stick out in the proper way. Nothing but making the form of the chicken organic by constant repetition, will enable one to draw it properly. When a sufficient number of impressions of the various parts of the chicken have been received by the mind, through the hand, then the hand will begin to obey the mind and be able to reproduce them readily. This is the stage desired, and it will come to almost any one who practices a sufficient time. The chief thing to do is to work, and not be discouraged by the distortion of the first forms that are made.

The same discipline can be obtained from cats, dogs, horses, birds, or any living animals that can be seen without trouble. The sketches may be made on pieces of paper or in a note book or sketch book. In some of my summer classes we frequently use blackboards in the open air, as will be seen from several illustrations in this book. It is of no use to copy the chicken a few times and then stop. The work might as well not be done if that is all that is done. The memory of the form must be fixed by subsequent repetition without the chicken. This is an important point. Sketch first from the real things, as often as is desired, to make the required mental and manual connection, and then as soon as possible test the mind and the hand by trying to recall the shape or shapes.

Do not be discouraged if the product is bad at first. Continually reenforce and refresh the mind with new impressions from the object, and in a short time it will be found that facility is obtained, and that much better power of expression is the result. The first pictures and sketches are not made to keep. Of course I understand as well as any one that there are degrees of capacity in this work, as in all other kinds of work, but I have

PLATE TEN

Painting in Color from Nature

Beautiful color work from natural forms can be done by children in the lower grades of all schools, if they are rightly instructed. Vivid memories of color should be received from fruits, flowers, insects, birds, fish, shells, etc. Color harmony and values should be taught from natural forms, not from stained and tinted papers. The butterfly should speak directly to the child. The colors, their areas, tints and values should be memorized and similar arrangements made in designs for various purposes. The teacher should be very careful in the beginning not to puzzle children with abstract theories about color, or to teach false nomenclature.

never yet found children, teachers, and other art students who have not been benefited, however bad their work may be at the outstart, by working this way.

Good drawing and sketches of this character can be made from the mounted animals and other specimens in any good museum. There is a certain stiffness and rigidity even in the best stuffed forms, but they are good to use if nothing better can be had. In some of my schools I have beautiful stuffed bird and fish forms of various kinds, mounted for study, but if possible I prefer the pupils to work from the real forms, and for this purpose excursions are made to zoological gardens and to other places, and the children are continually invited to draw animal forms in their native environment. Almost every one has a cat, a dog, or a canary, and there is no better practice than to sketch one of these forms continually until it can be put down successfully from memory alone.

Persistence Required.—To do this properly requires a good deal of artistic and manual skill, and these exercises are desirable for their aid in this training, apart from the even greater value to the mind, the judgment and the imagination that always accrues from vivid, permanent impressions registered in this way from the realities of life. Such sketching from memory must be done continually, not a few times only, followed by long intervals of cessation. It is like practicing on the piano; fifteen minutes or half an hour each day, steadily persisted in, will do more good than five or six hours a day with long intervals between.

I think this holds good with almost anything. All progress is a matter of persistence and self-control. There are many people who desire to be able to play well or to sketch well, yet who have not enough force and energy in their disposition to be willing to make the required movements continuously, and who allow the influence or force of their surroundings to draw them away from their desires. This yielding is in proportion to their weakness of character. I think one of the most valuable lessons that we can learn from this work is the fact that it helps to form the will and develops a tendency to continuous application, which increases as the difficulties increase, and our line of work is of such pleasurable character that it carries with it a certain amount of satisfaction and joy that cannot fail to expand and elevate the mind.

Memory Drawing of all forms and ideas is not insisted upon enough anywhere, though it is one of the most beneficial exercises for expanding the mind and giving the artistic ability so much to be desired educationally.* All good artists sketch incessantly; it is beneficial even to recall forms and designs when there is no opportunity to put them down on paper. Not life forms only should be memorized, but the mind should be exercised in mentally designing, and making compositions or patterns. Very valuable and useful power can be gradually acquired in this way. We should be able to think compositions and designs, and mentally to change them from state to state, just as the character of our speech or the current of our ideas change when we are thinking or reasoning.

Illustration 200

Common Mackerel —*Scomber Scombrus*

One of the most important of food fishes. It is finely formed and a very active oceanic fish. All the fish forms illustrated hereafter are drawn and modeled in my various classes.

Fish Forms are fine subjects for study. Usually simple in form, the children will be found to draw them with much delight,—good typical forms like mackerel, the salmon, the bass, perch, blue fish,—what fine shapes! There is something about the fish that usually makes children's eyes sparkle. I don't know whether it is because they have experienced the joys of fishing, or whether it is that the drawings revive the sparkle and the gleam of the actual fish in or out of the water, but I do know that children take much delight in making these forms. A few suggestions will be given as to drawing these on the blackboard and on paper. There is an endless variety

***The physiological condition of memory is that organic process by which nerve experiences in the different centers are registered; and to recollect is to revive these experiences in the highest centers the functions of which are attended with consciousness—to stimulate by external or internal causes their residua, aptitudes, dispositions, etc., into functional activity. Stimulated from without, they constitute recognition, that is, cognition, with memory of former cognition; stimulated from within, they constitute recollection.—[Maudsley, Physiology of Mind, page 514.**

Illustration 201

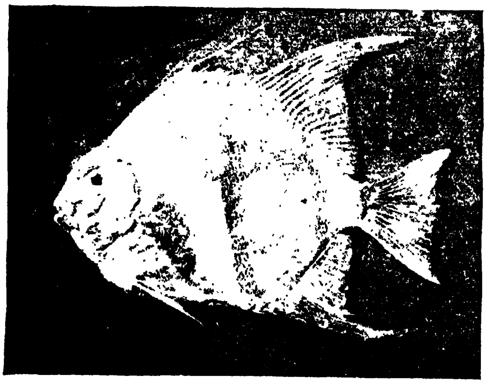
The Carangoid Fish—*Caranx hippos*is

This fish is related to the mackerel, American blue fish and pilot fish. This and other essential facts about it are learned by the children as they draw or model the form.

of form among the fishes. Some seem all head, some nearly all tail, some are without fins, some with fins like wings.

Fish are beautiful examples of color. It is important to draw the attention of the children to this. The colors are iridescent, pearly, and brilliant to a wonderful degree in some fishes; when they first come out of the water, they gleam like a rainbow. Get the children to recall these impressions. In many schools and homes small aquariums afford good opportunity to study the movements of living fish. Small fish have just as beautiful movements as the large ones. After some of my talks the children take a joy in visiting the fish markets. Nothing is more beautiful in color than a heap of shad, herring, mackerel, lobsters, crabs, and shell fish, when just out of the water, and children, when they once become interested, are fascinated and register many vivid impressions in various forms. Encourage them to look at these things. Hardly any one can go to a

Illustration 202

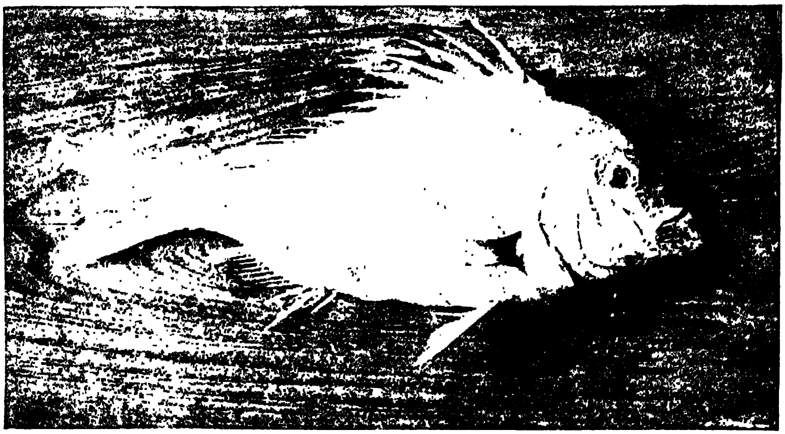


Angel Fish

fish market, when the fish are beginning to arrive, without seeing crowds of men and boys, usually idlers, looking at the splendid forms, the beautiful curves, the variety of color, as the fish slide about. If anything exceptional, like a large turtle or sturgeon, is on view, there will be a crowd around it for some time. There is something more than idle curiosity here, there is so powerful an attraction in these strange and beautiful forms that the attention of even the most careless is compelled for a little while.

This is the thing to lay hold of, with children, and it is a divine energy poured out on every one. On this we must build if we wish to get them in-

Illustration 203



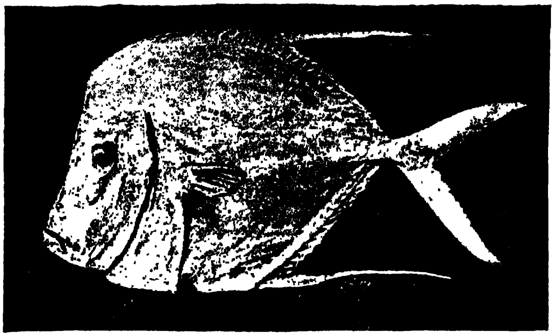
Sheepshead—*Archosargus*

A large and valuable sparoid food fish. So called from the fancied resemblance of its head and front teeth to those of a sheep.

oculated with the love of nature and the beauty and the joy that follow if this is cultivated to the higher stage. This energy must be cultivated and conserved, otherwise, like other vivid impressions of youth, it fades away, and finally, in a great many cases, is wholly lost. It must be cultivated skillfully and systematically from stage to stage. This a true teacher will do without taking the life out of the work by tedious, needless repetitions of tiresome formulas, graded steps, definitions, etc.

Typical Forms.—I use fish forms throughout all the grades. In the first grade I find the children fascinated in drawing a fish, while in the

Illustration 204



The Silver Moonfish—*Vomer setipennis*)
Called also Blunt-Nosed Shiner.

highest grades they are pleased to make various fish forms and also to idealize them in the way of dolphins of various shapes. The experience of many years has taught that the child in the beginning must have a concrete generalized fish form in its mind, a kind of type form if you like, one that has the usual spines on its back, the tail at the end, fins on the side, gills, etc., but which is not the picture of any special fish. But I find that when the children have once become able to make this generalized fish form with facility (and by making it, I mean when the connection has been thoroughly established between their finger tips and their brains so that they can reproduce it automatically as they think of fish), the moment they think of spines, the spines grow on the back; the moment they think of tail, the tail rays out from behind; the moment they think of fins, the fins are placed in position automatically; while the same is the case with the scales. I find also, if this form is thoroughly organized into the mental fabric, that children, when they have special fish forms presented to them, can readily grasp the differences and the resemblances, and with very little practice become able to delineate these forms.

Speaking Through the Finger Tips.—This is the manner in which I should wish all drawing to be done, and the way in which I have endeavored to make my pupils work. It has proven to be quite successful. To me this method is in accord with the usual process of mental development, it being simply the assimilation of certain impressions till they are made permanent and can be reproduced through the finger tips, just as we assimilate impressions and through other motor reactions give utterance to our ideas vocally or in writing. The time is coming when people will speak with their finger tips as well as their tongues. I mean the common people, not simply a few geniuses. I believe that there is a larger proportion

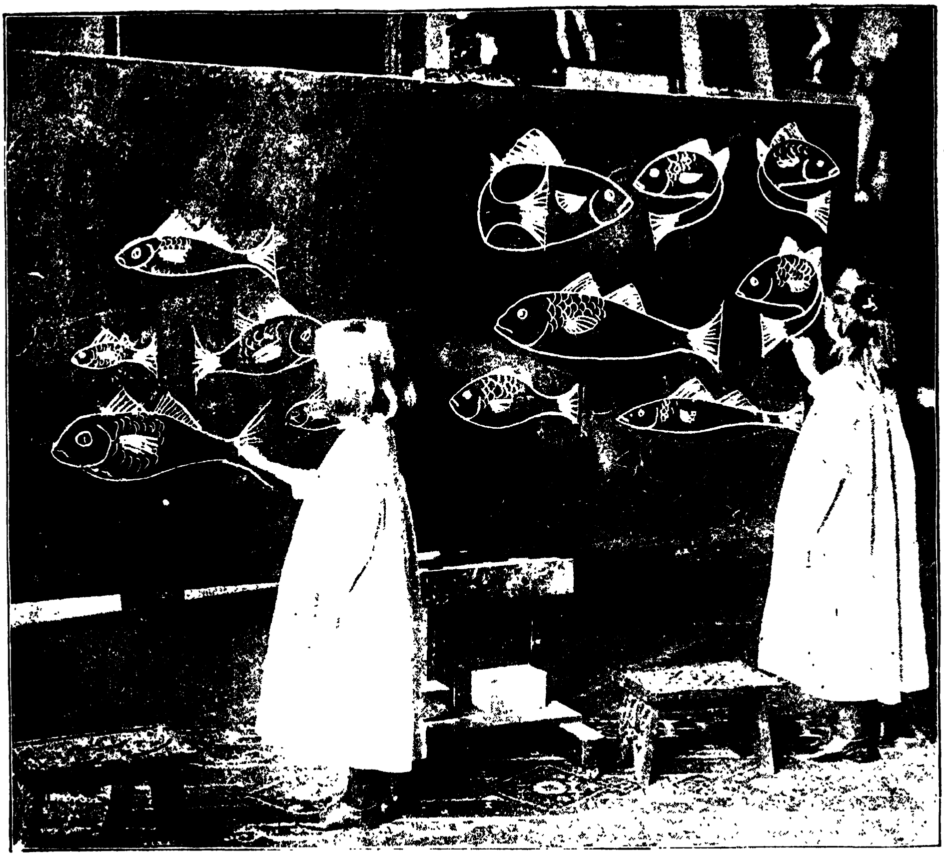
than we think of people who are gifted in this direction, and I see no reason why the hand should not respond to any idea or thought as instantly as the tongue usually does. In education, I have found that working in this direction is perfectly practicable; that the instrumentalities in all children and their powers and capacities seem as though they were specially endowed to this end. I really believe that all hands are capable, in the way of art work, of responding in an exceptional degree to some environment, or to some of the varied conditions of nature.

Notice the children drawing firsh forms in Illus. 205. These are generalized forms. In making them the children, of course, have had the real fish, a plaster model, or a diagram, to study. I am not as firmly set as some teachers on the subject of copying from models all the time. I find that a photograph or print will call up a good memory of the various parts of a fish to children, especially if they are encouraged to look at and memorize the real forms. I find every day that it is more important to get the children to mentally recall form than it is to imitate it from the object. Of course some imitation must come first, but the fine technic is a matter of years, and the ideas of form can be growing meantime. But there is a great deal of merit and discipline in getting the children to endeavor to make tactual impressions on paper of even the complex things they cannot readily have before them, like a horse, for instance, that they have seen on the street. If you speak of a car horse or a cab horse or a horse in any of the wagons coming along the street, and mention several parts of its form, the children usually look for these things the next time they see the horse.

I frequently ask them to draw a shad during the shad season, and find they do not know its shape. They have forgotten, perhaps, the shape of its spinal fin or its tail or the bulk of its head. Let them do the best they can for the lesson, and then request them to look at the shad, and you will find that the next time they draw they have a very vivid impression organized in the mind, of spinal fin or tail or head, usually an impression that is organized so that the concept never fades. It is to get this knowledge to come to the finger tips, instinctively on command, that we work

Importance of Simplicity.—Notice that these diagrams of fish that the children are drawing are very simple, that they contain the fewest lines possible. From the very beginning the essential features of form should be

Illustration 205



Memory Drawing of Fish Forms

The children are practicing drawing various fish from memory, to make different sizes and proportions, and to make them turn in different positions. The child should get facility of expression with a few essential features, before much in the way of detail is required.

grasped with a few touches. If I give a fish form to a student, of any age, who is not practiced in our method, there is usually an attempt to represent a maze of details, and the fish form or other form is lost in the endeavor to put down unessential features. To grasp the "essential" features and "to purge the form of superfluities" is of course the artistic part of the work, and this point the teacher can illustrate in different ways by showing good sketches, diagrams, and pictures by good artists. Invariably it is found

that great artists simplify things. And in drawing as a mode of expression,—the kind of drawing that we wish to get,—this simplicity and strength is what we aim for. There is no harm in the beginning to have little children copy one of these fish forms from the teacher's diagram on the blackboard, or from a chart or a good photograph. The teacher can also have real fish, bought for a few pennies, on the desk; can have a stuffed fish, a plaster model, or a living fish in a globe. He must aid the child, however, to get a certain proportion in this work, just as it gets a certain proportion in a leaf or an apple. The teacher must direct attention to the radiation of the spines and fins, the marking of the scales, and practice must be given in making these forms a number of times, till the proportion and detail of the different parts become automatic.

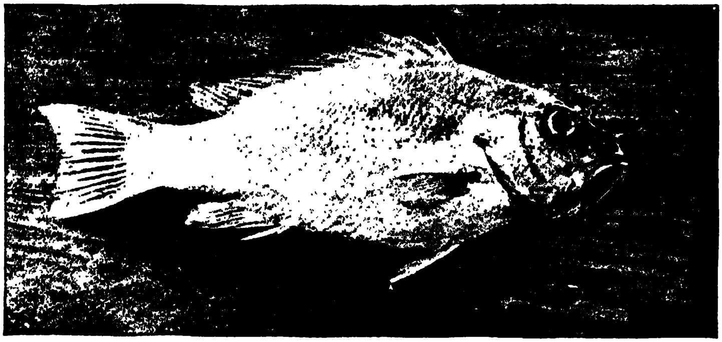
Then the teacher can let the children make the fish move about—or take different positions. This is much harder, but they soon conquer it. To make the fish turn around or swim up or swim down, or flap over, isquite difficult, but if they have once conquered the generalized form, so that it is automatic, they can very soon become able to make the same forms move about, and they take a great deal of pleasure in doing so.

A Warning.—Do not expect these things to come in two or three lessons. Remember, though you can give a little child these forms, that it usually has eight years of school time in which to practice. The children you see in our illustrations drawing these forms have become able to make any kind of fish in any kind of position, just as readily as they speak Of course it is a matter of years. It is a very foolish teacher who expects a child to make a fish or other animal turn around in a few lessons, a thing that some artists cannot do (if they are requested) after years of experience, simply because they do not draw from memory, by the expression of ideas, but by imitation. They must imitate some form before them, they have never done anything else.

This is usually the trouble with many of the art schools,—there is imitation of models and sketching from models endlessly, with very little memory work. I believe if a quarter of the time spent in looking at models were given to recalling, without the model, the impressions made by it, much more valuable results would be obtained.

Variety in Forms.—When the children have facility in making the fish forms, as illustrated, drawing them with ease, allow them to make

Illustration 206



The Sea Bass.
A large marine food fish, called also locally blue bass, black sea bass, black fish, blue fish and black perch.

varieties of fish, long and slender, short and thick, etc., and encourage them to look at fish.

Invite them to catch fish. If we register the vivid impression that comes when a child first catches a fish and inspects it in all its glory of sparkling color, if we can make this impression vivid and organic with the joy and the beauty that goes with it, we have done something toward developing the artistic sense;—and I attach much importance to these unconscious glimpses of nature forms, as seen in the fields, the streets and the markets. Let us do all we can to make them indelible and permanent, especially through the feelings and emotions. This can only be done by frequently recalling the images and nailing them into the fabric of the mind by deeds, by performance of actions through the different channels of human activity. For our purpose we do it by recalling and recording the forms as often as possible on paper, in clay and in wood. Beware of making any of this pleasant and enjoyable work a task. This is where the teacher's judgment and skill must come in. Through the same door that you open into the mind, this energy or spirit can fly away. Watch, therefore.

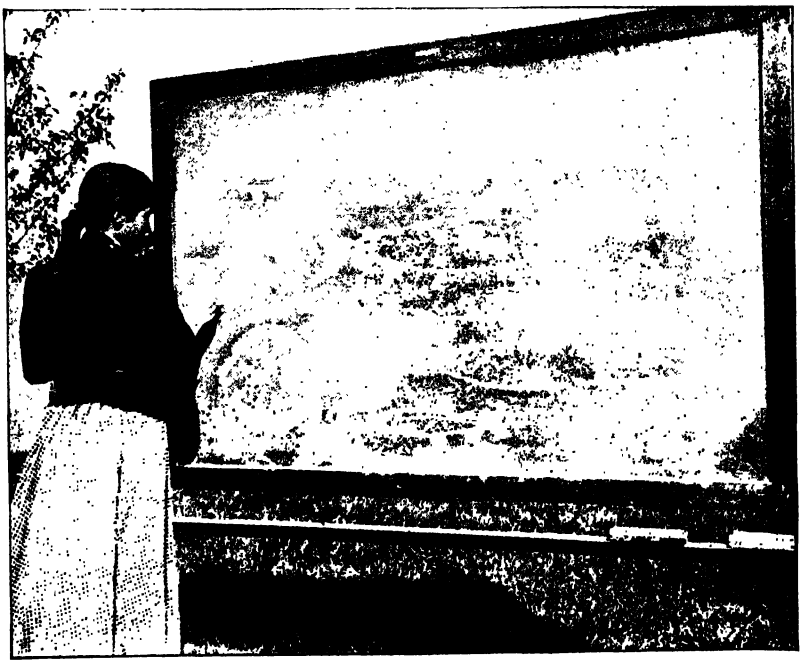
Invite the children to try to represent fish forms that they have experience of and with which they are familiar. They become sometimes especially fascinated by strange fish forms, and it is well, if you have the

facilities, to show them pictures of these or make pictures of them on the blackboard,—a shark, for instance, a flying fish, or some of the many various forms with special peculiarities.

By degrees various adjuncts of the fish form can be taught to them, with the names of the different parts, like the diagram on page 153. These technical terms and others have a more or less complex character, according to the grade of pupils that are receiving instruction, but they can readily be fixed in the mind by this method.

I have many children who know the names of the different parts of the fish, which they can express with ease by drawing. To get them to memorize the names of the first dorsal, the second dorsal, the pectoral fin, the ventral, anal and caudal fins, and other difficult technical names, without some means of systematically reproducing them, is a hardship, and one of the things from which the present schools suffer. It is unreasonable to task the mind,

Illustration 207



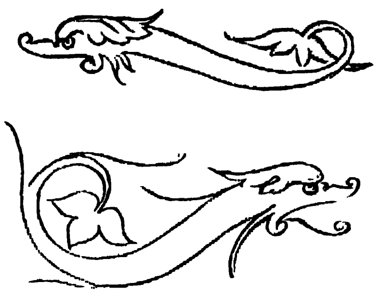
Drawing Fish Forms From Memory

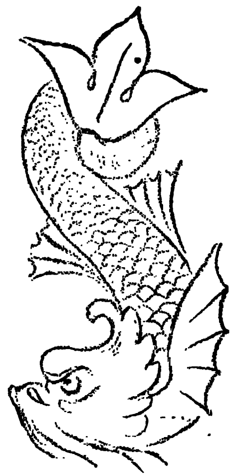
The children also write or print the name of each variety under its form, so that they never forget it.

the verbal memory, with such things. Placed in the mind, however, by these instrumentalities, learning, and even the practice of expressing abstract thought in symbols, becomes a delight and a pleasure, and is continued with ease.

Encourage the children to notice the strong erect lines of the spines, the stiff, springy look. In some positions fish assume most beautiful

Illustration 208





Fish Forms in Design

curves and when the children begin to idealize these forms, very fine designs and suggestions can be received from them. Notice the many varieties of form in which the fish is used in combination with other forms.

Fish Forms in Design.—Like other animal forms, the fish is much used in decorative work, and gives additional beauty to some parts. The scales are used for surface decoration of many kinds. Practice in drawing scales so that they fit is one of the exercises that I give children at certain periods. To draw scales so that they are equal in size and fit nicely, so that they gradually diminish or increase in size, compels a wonderful amount of attention, and requires a great amount of manual skill. To do it successfully in certain materials, like clay and wood, requires fine manual training. Further suggestions for the use of fish forms in design are described and illustrated in Chapter VIII of this book.

In making work of the highest character, of the most beauty, it is important that we should know as much as possible about fish forms and their color. The more intimate we are with these things, the more wisdom and the more knowledge we can put into the designs that we idealize or ideate from them. Very few people can really enter into the pleasure and the joy

of some of the great works of the best periods of different nations, simply because they do not see the connection between the natural forms and the idealized forms. Some of the most beautiful and wonderful of the Japanese and Chinese dolphins, dragons and grotesques are made from idealized fish forms. It is an added pleasure and joy in life to be able to perceive the beautiful as rendered even by "pagans" and other curious peoples.

Fish forms should be modeled in clay continually, especially if a vivid memory of the form is desired. They also make beautiful decorative forms for various purposes.

General Remarks.—I have given this lesson on fish forms enlarged and at length simply to illustrate and suggest a few points to instructors that can be applied equally to all forms, the same ideas and movements applying to everything created and suitable for instruction. Stupid and dumb is the teacher who cannot, even in the most degraded and forlorn environment, get the common bits of nature that are so silently eloquent. Make even the sticks and stones and grass speak to and through the hand, the head and the heart!

Illustration 210

Nature Study

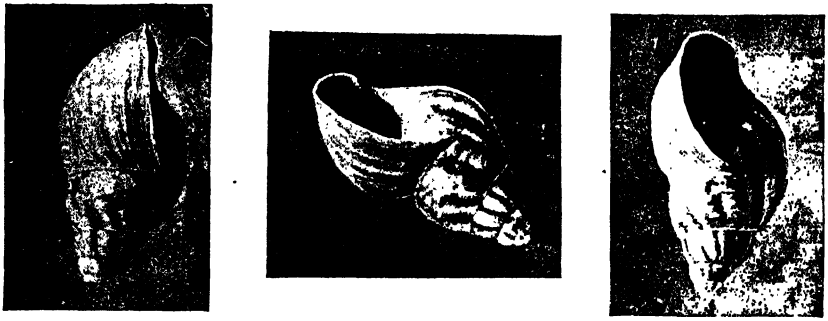
Drawing a chart to indicate technical names of the different parts

PLATE ELEVEN

Drawing from Nature

Rapid sketches are made of the movements of the dog. This work is difficult at first, but if the pupil models the form also, accurate memories of form are received and made permanent.

Illustrations 211-213



Various positions of the same shell, as memorized by the children. The shells being fine in form are good models.

CHAPTER VII

Drawing from Nature and from Memory *

NATURE IS THE BEST DESIGNER. Our pupils must assimilate a variety of impressions from nature before we can expect them to create anew. Take shells, for instance. It is almost impossible to think of a new shell, the entire field seems to be exhausted by nature, shells being of every conceivable variety. It seems as though nature had worked out every possibility to its utmost exaggeration. We have shells thick, shells thin, shells long and slender, shells very short and thick, with spikes, spines, processes, ad infinitum. Before drawing shells it is advisable for the teacher, and the pupils also, to make a few diagrams, illustrating the growth of shells by addition to the margin, as pictured in No. 214. They can be made to take much interest in the growth and structure of the shell. It is advisable to explain to them how and why shells assume the different shapes, from the flat, scalloped to the pointed, spiral form.

Simple diagrams should be made at first, almost conventionalized forms if you prefer, and study should be made of shells simple in form, like the scalloped shell, spiral shell, cockle shell, clam shell, etc. If some of these are in pairs and doubled (Illus. 215), it makes a still more interesting picture, and the children grasp the relation of actual shell forms to some of the beautiful idealized shell forms in ornament.

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*As much as possible, nature forms should be used in drawing. Good work, however, can also be done from photographs and books. Diagrams from books are used several times herein as suggestions.

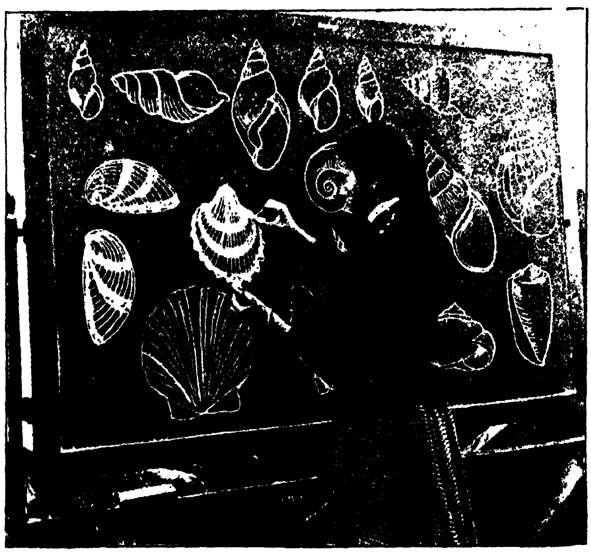
Illustration 214

Drawing from the Object

All sizes of shells can be drawn in the hand this way and form memorized. Small shells of beautiful form and variety can be purchased cheaply.

It is good practice to draw the shell freehand on the board from one held in the hand, making different views, then memorizing them, like the illustration 214. There is no better practice in drawing and color work than can be received from making accurate drawings of beautiful shell forms. Shells can be purchased in some instances for ten cents a quart. In a quart of such shells scores of perfect and beautiful specimens can be found. They last a long time and the children, if they are inspired properly, are never tired of looking at them. Shells are among the best things we have for teaching color. Some of them are perfect poems of color, and as they can be bought very cheaply, they are among the best things we can have for school models. The children have learned one of the most desirable lessons when they begin to appreciate the wonderful architecture spun into a shell, its form, its color, its structure and texture. When they can in the slightest degree reproduce its beauty, proportion and fitness in actions that are themselves fit and beautiful, the shell has fulfilled one of its missions.

Illustration 215



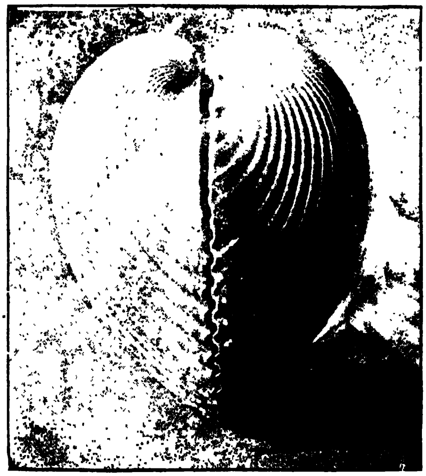
Drawing from Memory and from the Object

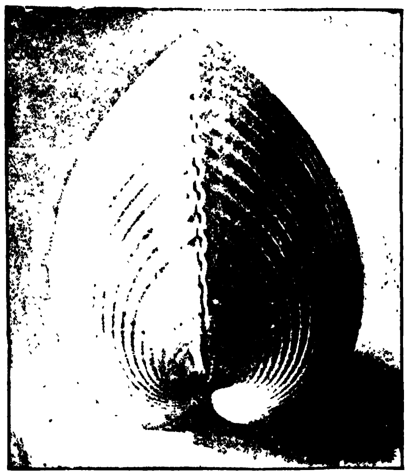
There is a great deal of talk about the expensiveness of school models. It is simply an excuse made by some ignorant people for the barrenness and

bareness of the ordinary common school room. A bright teacher can collect or gather clam shells and oyster shells that are perfect in form and color. Sometimes a clean oyster shell is a revelation of perfect colors and tints, being iridescent, translucent, pearly, etc. The greatest scientists or artists could require nothing better or conceive anything so fit. It is possible, for two or three dollars, to get a collection of shells of the commoner varieties that would stand the wear and tear of a class room for many years. The same is true of other forms.

I find usually that this idea of lack of materials is more a matter of ignorance than anything else. It comes from a barrenness of mind which is an outgrowth of the common idea, so fixed in the mind of most people, that reading, writing and arithmetic are the main things. Fortunately that

Illustrations 216-217



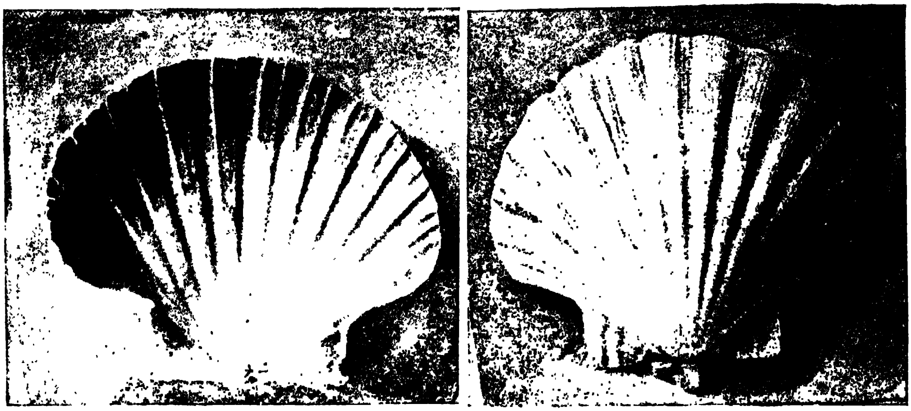


Shell Forms

Some of the most beautiful lines in design and ornament have been taken from shell forms. No study will broaden and expand the mind more quickly than to assimulate, first hand direct from the shell, complete ideas of fine lines, curves, structure, texture, color, etc.

time is passing by, and we are beginning to find school rooms filled with appropriate things. I read in a recent paper the account of a new school in a large city where the committee are actually requesting the sum of $100,000 for plant and fixtures alone. I know by experience that, unfortunately,

Illustrations 218-219

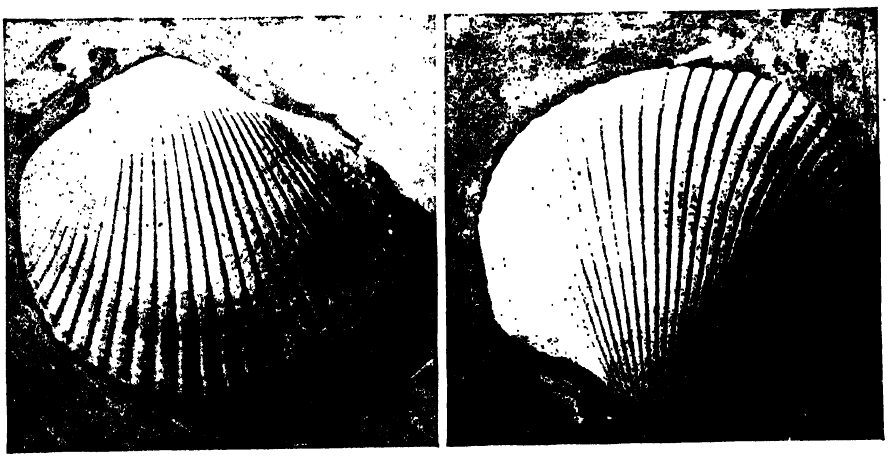


Inside and Outside of the Same Shell

a great deal of this money will be spent for elaborate furniture, cumbersome desks and closets, etc. But the beginning of the new era is upon us.

Blackboard Work.—Shells should be drawn on the blackboard at intervals. Allow the children to select any shell they desire and to make different freehand views of it on the blackboard. The shell can be held in

Illustrations 220-221



Lesson From Shells

The examples of tangential curvature, radiation, transition of curves, etc., are perfect on shells. The children should be carefully instructed to study and reproduce these qualities in pencil and with color. Some of the scallop shells are much used in carved work.

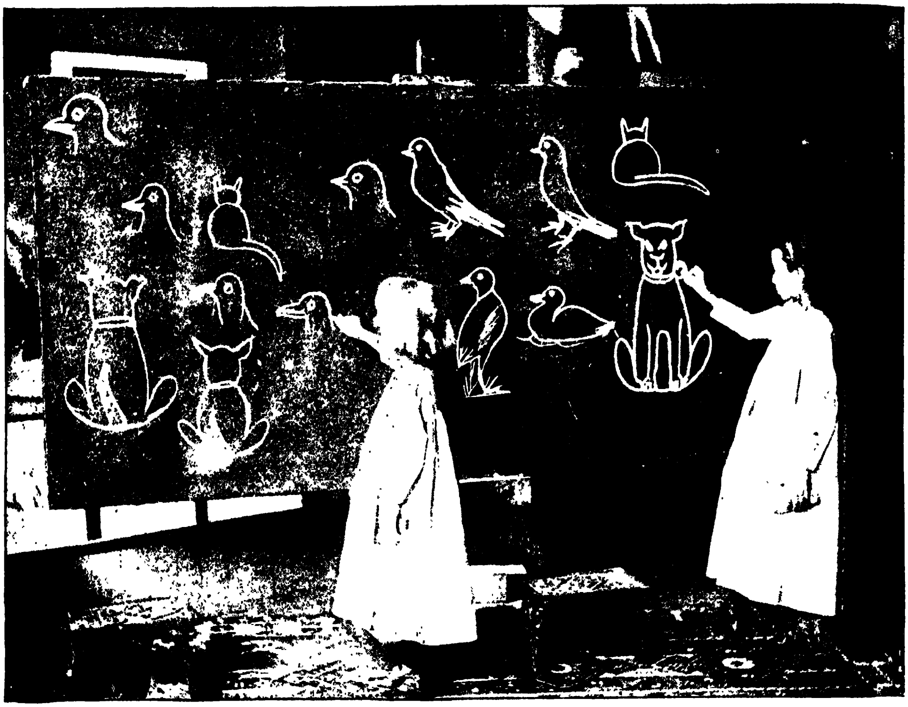
the left hand while doing this, and even very small shells can be used. At first allow the drawings to be as simple as diagrams and of the easiest views, gradually attempting the more complex positions, as facility is gained. Remember that the first object of this work is to store the memory with impressions of shell. To enable the mind to vividly recall or recollect shell, these exercises should be repeated until typical shells can be drawn from memory. Lead-pencil sketches for detail should be made, and also, if possible, sketches in color.

Shells should also be modeled in clay, producing both realistic and conventional copies.

Bird Forms.—Little children can begin to draw bird forms. The concept or typical idea of bird is made up, to the child, of the various impressions it has received from the birds with which it has been familiar. (See illustrations of children drawing birds on pages 160 and 161. It does not matter how crude the first attempts are. It is a good plan for the children to make simple diagrams of birds' heads, like those of the pigeon, crow, hawk, parrot, paroquette, eagle, and so on; or of the common chicken, the rooster, the duck, the goose, the swan and others. Side views of the duck swimming are perhaps as simple as anything in the beginning.

Endeavor to get the children to think of the shape of birds. Simple diagrams or drawings can be made on the blackboard of very different shapes of birds, for instance, the crane, the stork, the heron, and then birds of opposite characteristics, like the owl and the eagle. A simple bird form, like the sparrow or any small bird that can be readily procured, should become automatic. The children should be made by repetition able to put this form down without trouble from memory. When this can be done readily, then the bird should be placed in different positions and the child should be encouraged to make drawings of these positions and to memorize them. Allow the children to attempt these different positions on the blackboards. Of course to render a bird flying or spreading its wings is difficult, and it requires a knowledge that you must not expect from children in the beginning. But as they become able to place the simple forms in various positions, and as they get more practice, in drawing, of the different things required in their different studies, so they will become able to make these complex forms with greater ease than one would think possible if it be attempted to render them without this previous work.

Illustration 222



Primary Work by Little Children
Drawing bird forms, dogs, cats, etc., from memory, in different positions

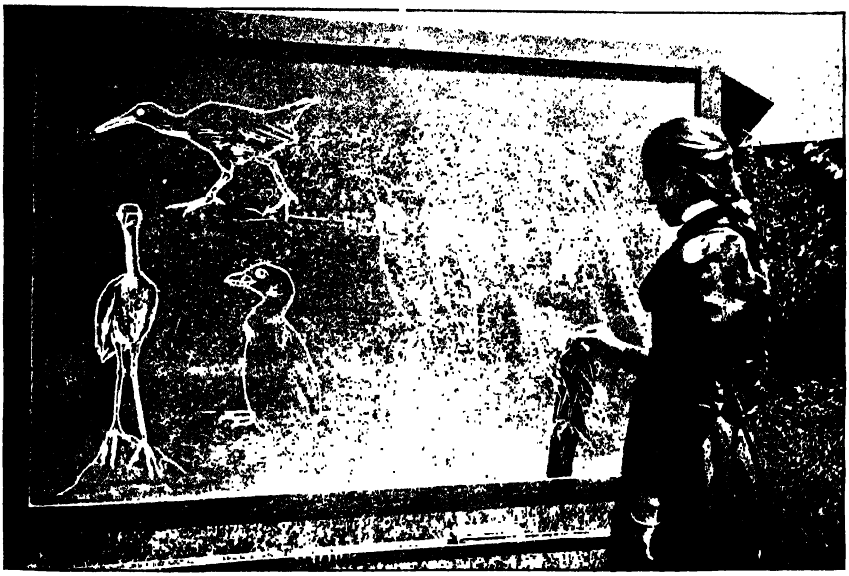
Encourage the children to notice different kinds of birds, as the canaries at home, the parrots, and other birds they see when they go to the zoological gardens, or the common birds seen in the country. Encourage them to make drawings of these things, even while they are moving about. I have numbers of children who can do this readily. It is not necessary that a bird should be stuffed or that it should be dead before you can see the length of its bill or the size of its head. If a child is looking at a flamingo walking about, making its peculiar motions in the water, it can notice the strange shape of the bill, the wonderful length and beautiful curving of the neck, the remarkable length and structure of the legs, and other particulars without any trouble. It should be able also to make a drawing or tactual record of these remarkable points. It does not matter

if the bird bends its neck while the drawing is being made; it is still the same bird and neck. With very little encouragement children become able to grasp the form and reproduce it, even when the model is moving. This is a great and desirable step in drawing.

It is only the most stupid kind of people who think that the living forms must pose before them to enable them to grasp the shape. The children you see working in the pictures here given have made many of the drawings from living forms. They can also make very good drawings of the same forms in any position without the models. The chickens have been drawn while walking about, the same with the parrots.

Of course in the beginning bad drawings result. No one can make six or eight diagrams of a crane without making the last diagram better than the first, if one has a crane or a picture or model of one to refer to.

Illustration 223



Memory Drawing

These bird forms have been memorized rom specimens photographed in this book. This pupil can draw any of the birds in different positions from memory.

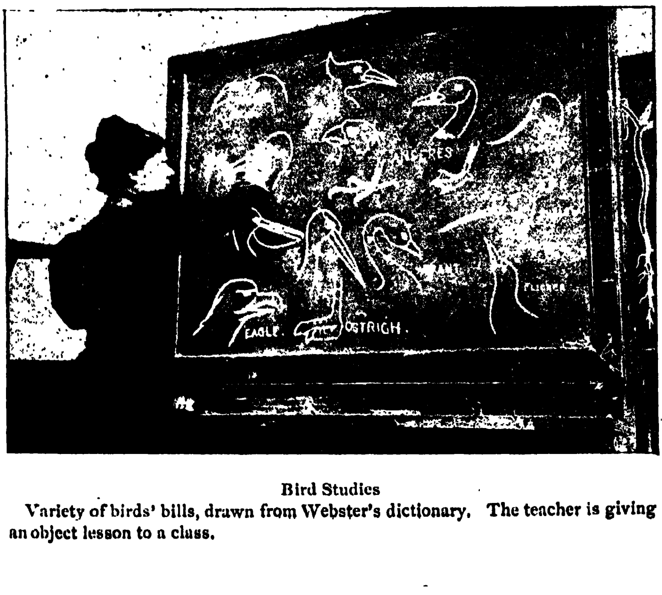
Illustration 224

Enlarging Drawings from Sketch Book
The same forms should be drawn in many positions and memorized.

It is the constant repetition, the association of idea with movement, tl constant endeavor to reproduce, that ultimately leads to achievement.

And do not expect likenesses, actual portraits of these forms, from li tle children. If they get any idea of the form in the beginning, th should be encouraged. When they have had sufficient practice with tl

Illustration 225



Bird Studies
Variety of birds' bills, drawn from Webster's dictionary. The teacher is giving an object lesson to a class.

memory drawing, some can reproduce images with the utmost fidelity, and it is remarkable what an amount of observation they disclose and of acute perception of details that they can render. Never expect them to render forms without first assimilating impressions from the real things, or from prints, pictures or drawings of some kind. They must be constantly sent to the source, to the thing itself, to receive fresh impressions.

By degrees they will lose the desire to sit and imitate detail by detail, and this is a valuable quality we wish them to get,—the power of being able to mentally photograph the object they look at, and then to revive it later; to be able to recall it with its original vividness of form, color, light and shade,—its essential qualities. That this can be done and well done by children I am convinced from the product that we get in our schools. If it is done systematically throughout all the years of school life, I claim that we will have a product that will be much more valuable than any yet attained. As teachers, this is what we must aim for.

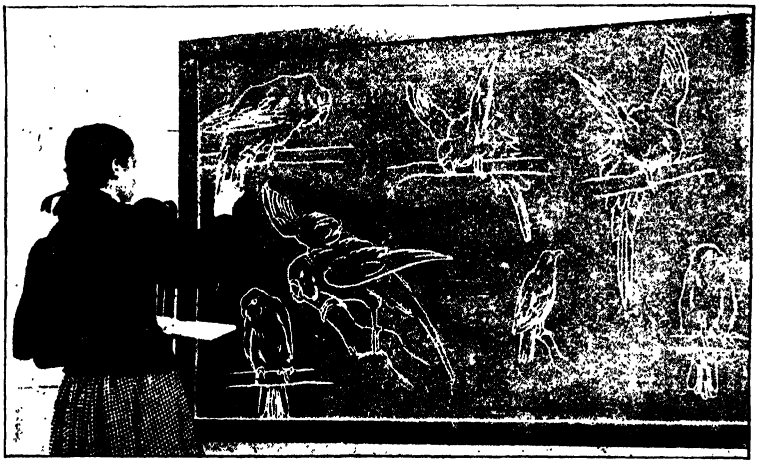
Color in Birds.—Let the children study a feather. Beautiful lessons can be given on a feather. And then, wings! Is there anything more beautiful in the world than a wing, in its wonderful structure, form, texture, color? A few wings of different kinds should be drawn repeatedly till the children can automatically reproduce the overlapping of the pin feathers and the short feathers, just as they draw the scales of a fish or any other detail. There is nothing more beautiful in the world than the appearance of some flying birds; the spread of wing, the gradation of form shown by the feathers, the regularity, strength and beauty of movement must impress the most careless. Children can be encouraged to make simple diagrams of flying birds, like the pigeon or the sea gull, and they will very readily when they see these birds watch their movements and make visual notes of their different positions when flying. The same is true of birds swimming in the water, like the duck, the goose and the swan,—the perfection of living beauty, grace, and fitness. (Illus. 232.)

Illustration 226

The children should be obliged continually to notice the colors of birds. I believe we can get more real knowledge of the tints, the tones and shad-

ows, and the harmonies of color from a dead sparrow or a pigeon or the head of a duck than from all the books and stained papers that have ever been printed, for the purpose of teaching color. Some colors on birds are ravishing. They shine like jewels, and there is a flashing effulgency and a delicate iridescence on the neck of a pigeon that will in a measure reproduce the soft glowing radiance of the heavens, to the heart who can

Illustration 227



Enlarging and Memory Drawings
Of birds in various positions from sketch book. The original sketches were made from the aeal birds.

look at it with sufficient love. If there is anything in education that we ought to cherish and to nourish, it must be this; to give the children a feeling for these things, to touch their emotions if we can, to infect them with the almighty energy of the love of nature. These experiences help to develop desirable phases of character in the young, which are seldom reached by other means. Other bird forms are shown on page 179, and elsewhere in this book.

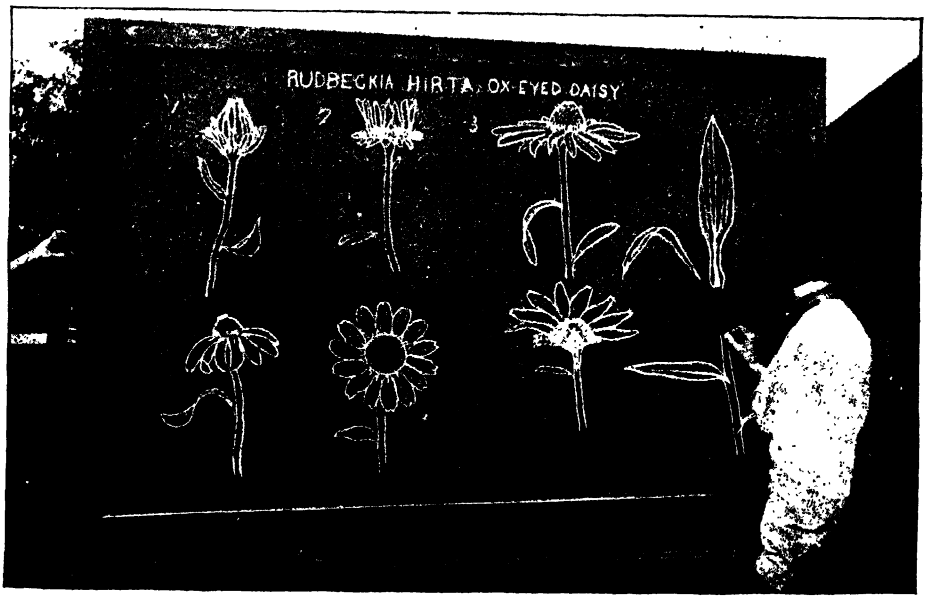
Botanical Forms.—Splendid lessons in drawing and elementary botany can be given. Botanical forms are especially beautiful, interesting and useful for school work. The simplest leaves and flowers, the commonest weeds and grasses, make good illustrations, and the pupils can be led on

from the simple diagrams made of these forms to the most abstract and difficult scientific work. The difficult nomenclature used in botany can be memorized without effort if the lessons in drawing are given rightly. The tactual, muscular and visual impressions seem to make the form and the name stick more readily in the memory. They can be recalled more clearly at any future time.

Take the horse-chestnut leaf, for instance (Illus. 230). This embodies the whole of the laws which are to be desired in some of our work. It has perfect grace of form, proportional distribution of areas, radiation from parent stem, tangential curvature of lines, even distribution of surface decoration, repetition, growth and a number of other minor qualities. This is also true of an assemblage of leaves,—with their equal arrangement of masses, and perfect distribution of group or groups.

Try to make the students enter into the beauty of these simple forms.

Illustration 228



A Lesson in Drawing and Elementary Botany

Use the real flower forms to draw from as often as possible, then memorize the characteristic features, as described in Chapter VII. The last flower form is a cross section of a daisy. Small drawings should also be made in pencil and color. The drill work in Manual-Training drawing in the present and preceding chapters is of wonderful value in imparting the faculty to draw from objects of all kinds.

Do not allow them to create freak units. When we have such a wonderful range in nature of leaves, flowers, shells, and so on, it seems foolish to require students to make kite units and the varieties of the kite unit, as some stupid systems do. If the child is made to produce these forms, they are simply wasting valuable time, but the tendency of a great deal of the present mode of culture is to create freaks. All the objects of nature are beautiful, created for our admiration and for our study.

For instance, take the leaves in illustration No. 231,—the pedate, lobate, crenate, palmate, cordate, dendate, binate, and other leaves. If these are drawn, instantly the technical name, the appearance symbolized by

Illustration 229

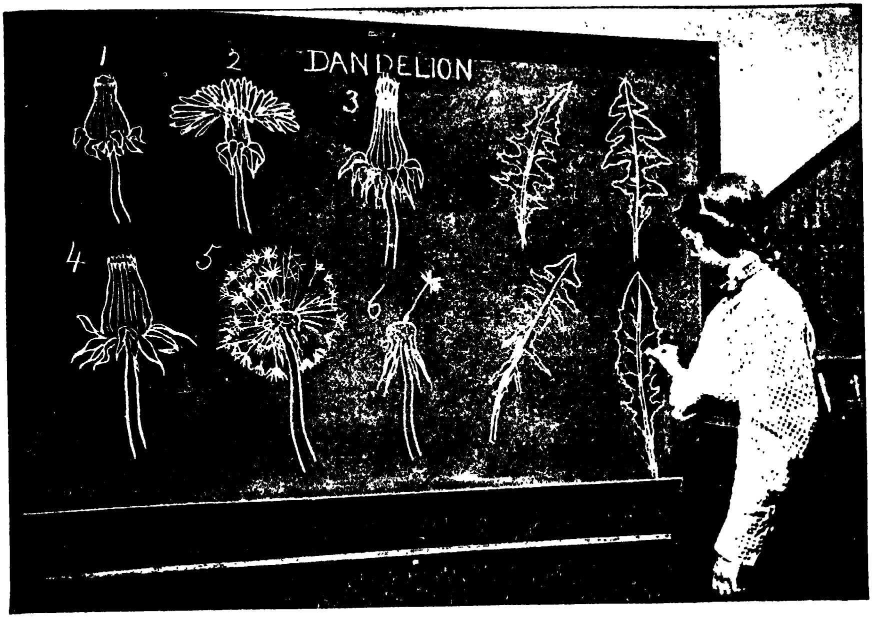
Drawing from Fruit

Fruit, flowers, foliage should be drawn and memorized. In the spring many kinds of blossoms make attractive studies. Branches of foliage alone make useful models.

the name, is registered permanently. This is a great help to the language work of the children, especially when they begin to dissect the plant forms, and the work from the many different parts begins to be complex.

The technical names can be mastered without any trouble, and some of these technical names are very formidable, even those describing the ap-

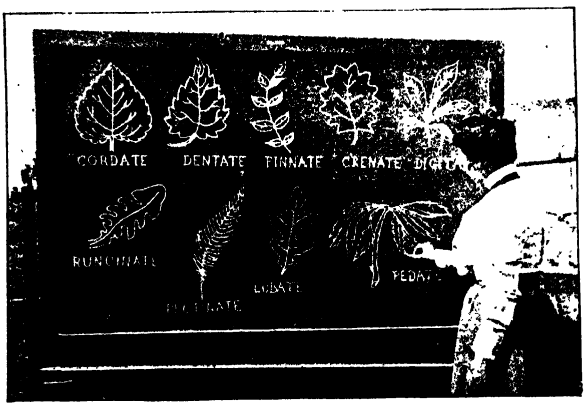
Illustration 230



Botanical Drawing

In this drawing, six stages of the dandelion have been illustrated, with various leaf forms These diagrams are drawn from memory. Accurate drawings have previously been made with pencil from the plant

Illustration 231



Botanical Drawing

These cuts are from Webster's Dictionary, and the children memorize the technical terms with the form by repetition

pearance of a simple leaf. I have no trouble even with children of the grammar schools in getting them to remember these terms, if they have had sufficient practice in making the diagrams and drawings, with, of course, the auditory impression of the name associated with the drawing at the same time. Understand, I do not mean notes taken at random during a long, tedious talk about function, growth or structure of various plants or flowers, but I mean the close attention and clear perception of a single plant or few parts of the plant, until a complete mental structure or thought-fabric corresponding to the plant is erected in the mind to stay. The main thing is to actually do and act through the eye, ear, tongue, touch, muscular sense, etc., instead of merely reading about or listening to a lecture upon the subject. I have seen so many classes of teachers and normal-school graduates who have listened to thousands of facts poured out in a stream, and who have filled scores of note books with diagrams and notes, yet who have failed to fix in the mind anything about their work. The many impressions have obliterated each other and only partial ideas result.

Illustration 232

Swans

The perfection of living beauty, grace and fitness

Illustration 233

Dolphin Forms in Conventional Design

CHAPTER VIII

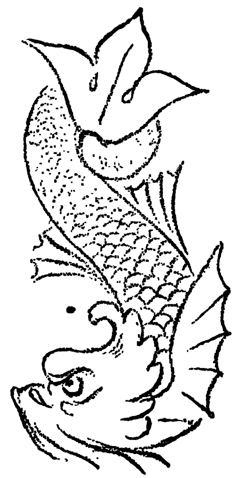
Conventional and Symbolic Forms

DOLPHINS MAKE VERY BEAUTIFUL FORMS FOR DRAWing. It is very easy to memorize one of the simplest forms, and then, by practice, to get facility in making this form in various positions, as shown above. Do not let the dolphin be feeble-looking or weak, but let it be made with good strong curves in all of these conventional shapes. It is a good plan to begin with a form almost as simple as the scroll itself (Illus. 234), and then make it a little more complex, in different positions, suggesting the mouth, and with crockets for fins and spines.

The next stage should be to introduce still more detail in the head, putting real spines and fins in different positions, as in 235. Then make it more elaborate by getting all the characteristic features of a dolphin in good proportion and by adding scales, a good tail, form and even with wings, if desired. In making these forms for decorative purposes, it is perfectly proper to do anything one pleases in the way of modification. Units of design of all kinds can be used in combination with the form; it can turn into leaf forms, the acanthus leaf being frequently used in this combination.

The dolphin's head can be used instead of the scroll termination in almost all patterns, enriching them very much in some cases. In drawing this form in patterns see that it becomes an actual part of the pattern. Do not make it look stiff, as though it were added. It should grow out of the pattern, or the pattern should grow out of it, naturally. Dolphins, griffins and grotesques are never successful and cannot be drawn with much success unless they form part of the design. Do not use them too frequently in

Illustrations 234-235



the same pattern. It is very good practice to make the body take different positions for certain purposes, as suggested in the headpiece for this chapter.

The dolphin is one of the best of all forms for use in wood, clay, stone and metal. The fish form must be thoroughly studied to get successful dolphins. There is a squirmy appearance about a dolphin that is taken from the fish, while the scaly appearance of the body, the eye, the spines and the fins are usually fish forms, and the better the fish is known the better these forms can be reproduced. To carve these forms successfully, even after the form has become pretty familiar by drawing, it is necessary to model them in clay several times.

Grotesque fish forms of simple character can also be made, an instance of which is shown in Illus. 233. These are all suitable for designs for various purposes. Make the simplest forms first, and as they become familiar try the more elaborate ones. Any good book of ornament will

contain dolphin forms, but it is still better to see models of the real animal in material of various kinds.

Griffins also are conventional or idealized animal forms. To make successful griffins, pupils must understand the character of heads of dogs and lions, and the shape of their bodies. Griffins can be winged, they can have spines, they can have bodies like dolphins, without legs, or they can

Illustration 236

Idealized Animal Forms

This picture shows more clearly than No. 233 the strength and freedom with which the lines are drawn. Advance from the simpler to the more complex.

have two legs, four legs, and any kind of tail, as suggested in illustration 236. The wings can be turned into leaves or scrolls, as can any part of the body. The griffin is simply an animal form introduced as an element of variety, one which allows the introduction of beautiful curves, and which, when done properly, will improve some patterns very much. It is a good

plan in learning to draw these forms to originate them, because each one should be able to make a dolphin or a griffin with a certain amount of style.

It is important to begin with the very simple form, almost like a scroll and then give it still more detail as one advances in knowledge of its characteristic features. These shapes can be made to fill any space, and of any proportion. The necks can be twisted in and out, the wings can be rudimentary or extended as much as the student may desire. It will repay any one to notice the beautiful forms of griffins, grotesques and dolphins. These forms will always be good if the essential character of the lion or the tiger is grasped. An expression of fierceness is necessary to a good griffin. It should never look weak, like a kitten. It is a good plan to practice making it fierce and to sketch open the jaws as widely as possible.

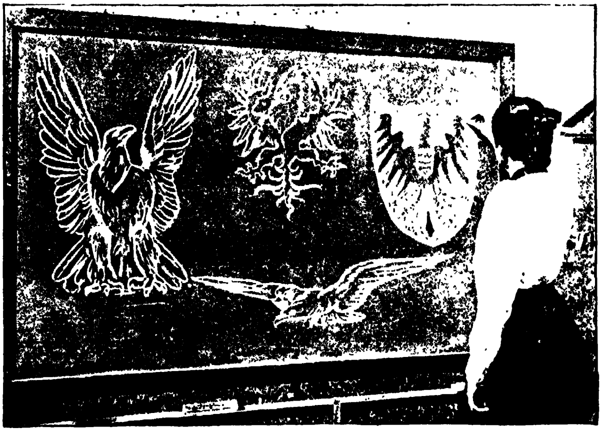
To grasp this form practically and to become able to draw it with thoroughness, it is absolutely necessary to model and carve a good type several times. There is no better practice in drawing on the blackboard than to make, when a little facility has been acquired in making the simpler forms, the more complicated ones in the different positions,—with short wings, long wings, wings closed together, wings extended; to make them jumping, to make them erect, to make them crouching; to throw the head up, to bend it down, to make the mouth stretch open in various degrees. Some beautiful examples of griffins rampant can be found in heraldic devices of various kinds. Modeled and carved work in many materials will embody dolphins and griffins.

The Bird Form is conventionalized in a great many ways. It can have the body of a lion or a griffin, and the wings and body can turn into the acanthus leaf or any of the variety of units desired. It is much used on account of the beauty of the feather forms, the curves of the neck and the talons. It is used in ecclesiastical art. Next to the griffin and the lion, it is one of the commonest of heraldic devices. It is the national emblem or device of various countries.

To produce these decorative figures well real bird form must be studied. There is a fierce expression about the eye and the bill of an eagle, and an energy about the legs and claws, that is very beautiful. If these essential features be grasped and the form embodied, the resultant form must of necessity be beautiful. Some coins have the eagle in various positions

stamped on them and they can be studied to advantage. Avoid feebleness and weakness in design of this character—its beauty depends in part upon its strength and virility.

Illustration 237



Decorative Birds

These designs are copied and memorized, then other arrangements of similar forms are made, or entirely original designs are created.

It will be of advantage to study a wing and the different parts of a wing. Some of the arrangements of pin feathers and minor feathers on wings are beautiful, and the wonderful way in which they change their position when the wing is fully extended, partly closed and fully closed, repays any amount of close observation and study. It is a most perfect example of fitness and adaptability.

In drawing feathers, or in modeling or carving them, the main features only must be grasped. When we try to put in the detail of each feather the spirit is usually lost. The large groups must be put down, the striking features and marks, but the detail must be left out. Wings can be idealized and conventionalized just as the other forms are, and very great variety of changes can be given to them.

Drawing From Objects.—Children should continually draw from various objects that interest them. If they have had proper training in

elementary work, it will be very easy for them to sketch comparatively difficult forms with much truth. The birds, flowers, fish, shells, etc., are interesting, but it is also important that other forms not quite so entertaining should be drawn.

Great care, however, must be taken not to render the children tired and stupid by giving them too many uninteresting shapes. The cubes, prisms, cylinders, and other blocks and abstract forms that have been given too much to children in the past, actually seem to make them blockheads for the time. We must make the young love the work if we wish true art, and the greatest art of the teacher is to bring in the uninteresting forms without making the children tire of them. Blocks and type forms continually administered to the children by stupid teachers, who consider that through them they will get a love of nature, are responsible for much of the lack of interest and disgust of children for art work. The true art forms are natural forms, and God has planted a certain beauty and fascination in some of the simplest forms on purpose to inspire love. The truest inspiration comes from the common natural forms, and to get the children to love nature, then, is one of the chief works of the elementary teacher.

Children will take pleasure in drawing boxes, books, furniture, boats, tools, etc., but great care must be taken not to make them dislike the work.

It is good practice for pupils to draw different kinds of printed letters from type and from memory. Very few people know the actual shape of common printed letters in books and newspapers. It is very good discipline in free-hand work to space out and draw block letters on paper and on the blackboard, being careful to make the actual form of the type without measuring and without ruling lines. Ornamental letters can also be copied, and then original designs attempted, as illustrated in Nos. 238-241.

In these suggestions for manual-training drawing, it is not possible to give details about light and shade, color-work, perspective, etc. Unless the teacher really understands these principles, formal lessons should not be attempted. No one should attempt to teach these subjects unless qualified to do the work.

Children should never receive formal lessons or lectures in perspective, except by continually drawing forms of different character, and then having their attention drawn to self-evident facts. Thus the abstract part of the work gradually dawns upon them in a natural way. Nothing is more

Illustration 238

Exercises in Lettering and Design

Some of these letters are copied and memorized. Various styles of type should be made, without the use of ruling and measuring. It is quite difficult to draw simply formed letters straight across the board equal in size and spaced correctly.

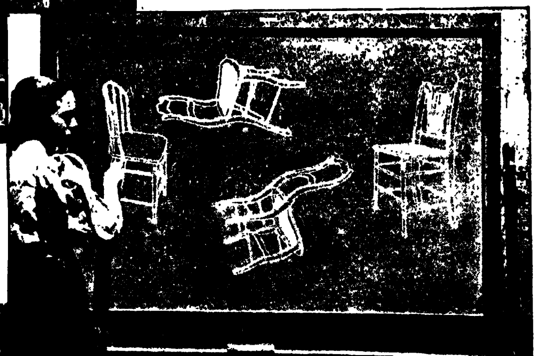
Illustrations 239-241

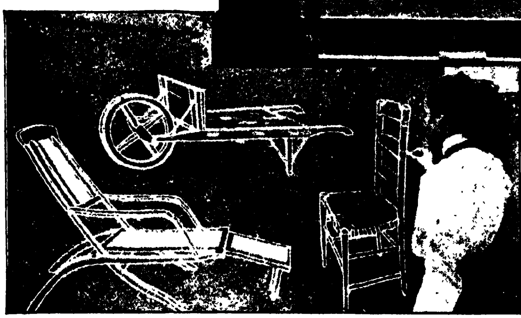
Colored Designs for Initial Letter

Made by pupils of manual training classes, Young Women's Christian Association, New York. It is impossible to reproduce in black and white the beauty and charm of these illuminated designs in several colors.

injurious than the lectures on perspective given to some pupils about "angles of vision," "vanishing lines," "picture plans," etc., before they are ready for them. They tend to obscure the subject so much that I have known many

Illustration 242





These children are memorizing chair forms. The chair is placed near by and drawn in various positions many times, the lines being entirely freehand and not erased until finished. The character of the lines is better shown in the larger engraving on page 177. The perspective is not correct every time, but each time the form is drawn a more vivid memory of the correct form is produced and by degrees the various parts *are drawn into* their relative positions without trouble. To make the various parts of the chair move into their right places on the flat surface is the problem. Merely drawing it once with labored detail will not enable the child to know the complex form. It must memorize the form, by feeling through the eye, the touch, and the muscular senses, the various positions in relation to the eye. Drawing from objects of this character has its proper place, for it obliges the pupil to express through the hand the perception and memory of artificial forms as well as natural forms.

But this practice is not allowed at the expense of facility and sweeping free curves and touches. To make the hand spin true spirals and accurate curves of all dimensions, at will, implies a dexterity that is not only indispensable, but that is useful in every vocation.

Drawing from Objects in Various Positions

students to be only confused by the seeming complexity of a comparatively easy subject.

To understand correct perspective is abstract work. It requires a certain amount of reasoning, that must only be done *after* a sufficient number of visual and tactual impressions have been made; then it becomes

clear and plain to the dullest pupil. Perspective is very often taught as syntax used to be taught in language work—the hardest part first, the rules before the words.

Form is first considered, and then comes light and shade in color. I lay great stress upon the pupils learning form by modeling, and learning light and shade also by modeling, in Book Three. If possible, pupils should be allowed to use light and shade and color in drawing from the birds, fishes, shells, leaves, etc., as well as in designing.

The simplest forms about the house are good subjects for drawing. To be able to draw chairs free-hand, as in some of the pictures herewith, is good

Illustration 243

Freehand Drawing of Chairs in Various Positions

This larger illustration shows the strength and positions of the lines more clearly than the smaller pictures in No. 242.

practice. Of course, in drawing them on the blackboard only an outline can be rendered, but to make that outline free-hand, without erasing, and to place the chairs in different positions, is no easy task. If, however, the pupils

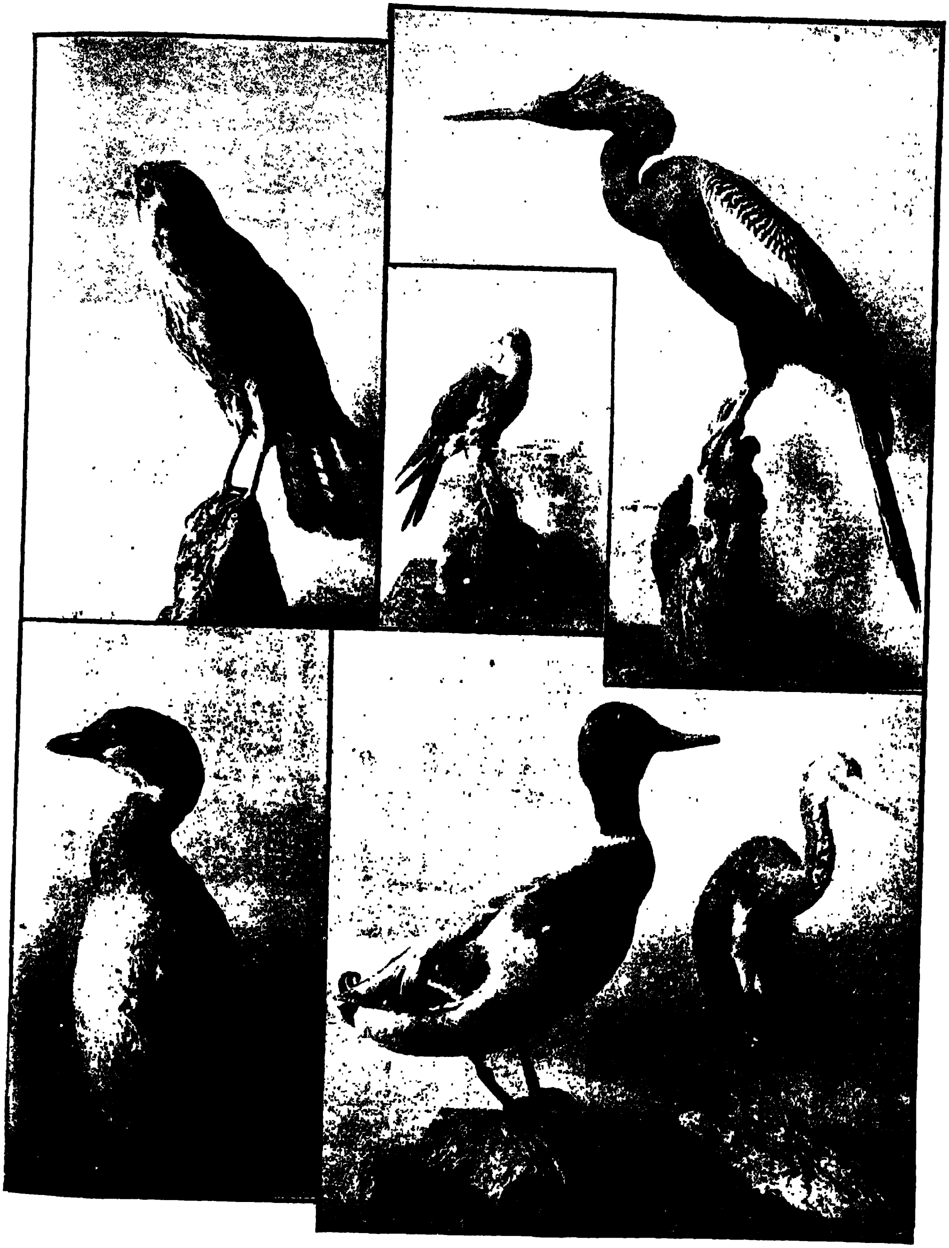
are encouraged to repeat their poor drawings until they actually get good chairs, and then become able to draw them from memory, these comparatively complex forms, and others, can be drawn with considerable ease. The perspective is not absolutely correct in these drawings, but to make them freely, especially when foreshortened, and when the chair is quite near, shows skill and power, particularly when the lines are drawn from the first intention and are not changed.

Animal forms should also be drawn freely, as, in Plate Eleven, the pupil trying to get the movements without detail, trying to get the essential features with the fewest possible lines.

Symbolism.—Some of the most wonderful art forms in the world are symbolic. It is important that we should understand symbolism. Too many people see forms in art, decorations of all kinds, without understanding their import. I do not think one person in a thousand begins to appreciate why some of the greatest and simplest forms are so interesting and beautiful. Most people look at ornament, and at conventionalized and symbolic work, as the savage looks at print,—regarding them as simply marks, forms, colors, that convey no idea. The mind does not grasp any of the thought conveyed. It is important that common people should be able to comprehend the abstract idea of these things through observation of concrete forms of various kinds.

Symbolism is a word of Greek origin, and signifies a visible form; implying something that is in itself incapable of representation. It embodies a thought that is the sign or symbol of something higher than merely meets the eye. It has been used in all times, and some of the most wonderful as well as some of the most beautiful art work and ornament of all periods have been symbolic. Before print was in use, or had come into common use, symbols were frequently employed as a means of impressing on the multitudes truths that were incapable of being represented by words. A sign lifted up meant the same thing to everybody; a statement in words could hardly be as generally understood. Symbolism has been used, perhaps, most widely in religion.

Ecclesiastical work of all periods embodies some very beautiful conceptions. These are symbolized in the simplest possible forms, and gradually come to mean the same thing to different people. The circle, meaning eternity, without beginning and without end; three circles interlaced,



Bird Forms

These real birds, with many others, are used as models for the children to work from. They are drawn in pencil, painted in water color and modeled in clay.

meaning the trinity in unity, or the three persons of the Godhead. The trefoil has the same meaning.

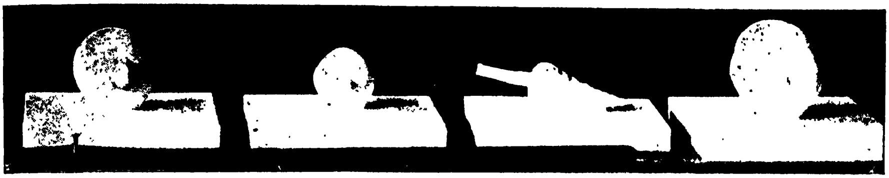
The cross has been employed in myriad forms all over the world, from two sticks crossed to the greatest concepts in art that it is possible for the mind to bring forth. It has gradually become the keynote of Christianity, which it pre-eminently symbolizes. At one time the symbol of suffering and degradation, and forever after the symbol of achievement and victory, it to-day forms the ground plan of the noblest buildings, and in gold is a fitting emblem to crown their pinnacles. Bejeweled and begemmed, and stamped on the books of prayer carried around in hands gloved in costly fabrics, the cross has too often lost its meaning.

The nimbus or halo is a symbol. Among the early Christians many forms of this were used to symbolize their rites. The Egyptians used it almost entirely. Their hieroglyphics are symbols, written pictures, some of them embodying very fascinating meanings that should be understood. Many living forms have been used as symbols,—the serpent, the dove, the eagle and a great many others. It is wonderful to what an extent ecclesiastical art has gone in the representation of these forms. Take, for instance, the passion flower, which symbolizes the passion of Christ. To every part of this strange and beautiful flower has been attached some symbolic meaning. It can be seen used in every conceivable form in wood, clay and stone, in churches; even windows, and fabrics of various kinds are embellished with it.

Plaster Models.—The series of vegetable fruit forms and forms illustrated herewith (No. 244) suggest an excellent primary course for young children. They can be graded according to the desire or inclination of the teacher from the simple forms to the more complex. Each one of these vegetable or fruit forms has been cast from nature, endeavor having been made in procuring the original forms to get those most typical in shape.

Children should not draw from casts of fruit and vegetables unless it is impracticable to provide the real forms. As often as possible, real apples, pears, potatoes, and other fruits and vegetables should be furnished for the children to study. The forms are also to be modeled in clay. Only by doing this repeatedly can organic memories of the forms be made that will

Illustration 244



Models of Fruit Forms

be permanent and valuable. These forms, heads and other models are also more attractive to the children than geometric forms and blocks, and inspire them with more desire to work and more admiration for nature. It is desirable to have as many good casts of art and nature forms as possible. All

Illustration 245

Animal Forms

These plaster models are nearly life size, and with a number of others are used for drawing, modeling and carving.

of the models pictured in the various parts of this book are used in my schools. Many of the casts are original.

The casts of animals' heads have been made especially for school pur-

poses. One series is quite small in size, the other series is of life size. Some are quite difficult and some are easy. It is best, however, to allow the children to make their own selection. These forms are carefully modeled, and in some cases have been made by skillful artists of acknowledged reputation. As well as being useful for class purposes, they are especially appropriate for decoration of the class room. They should never be shut up in closets, but exposed to view all the time. It is a good plan to change their positions occasionally, to hang them in different places in the room, or to turn them around to show different views.

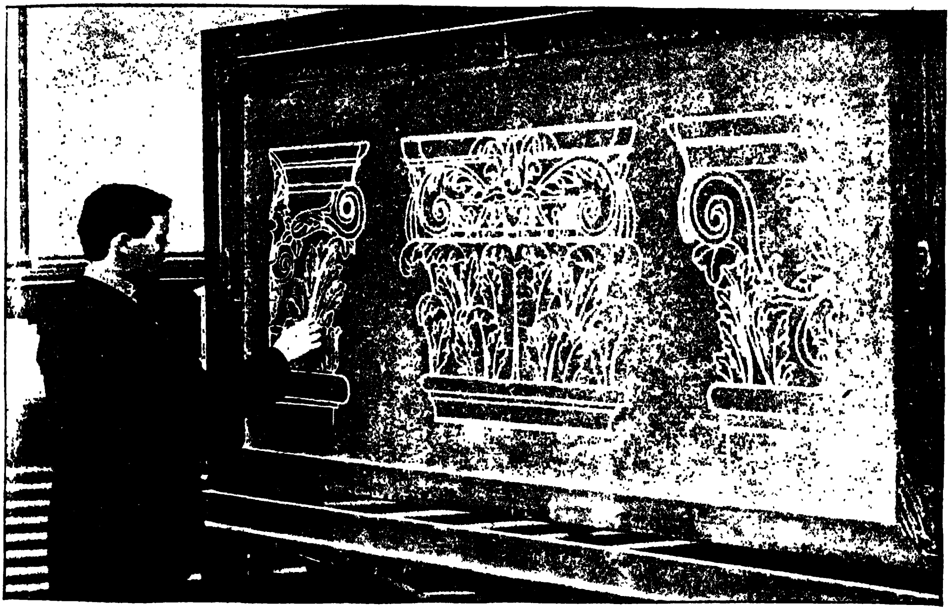
In some of the classes, casting in plaster of various forms is done. It is good practice, and requires skill to make a fine cast from nature. The work is very simple and can be done by grammar grade children who have had any manual training work. All teachers should be able to make plaster casts of leaves, fruits, fish, birds, animals, etc. Except the original, nothing is more instructive than a fine cast of some natural form. The finest detail can be reproduced with the utmost fidelity. The time occupied in making the casts is almost the only expense, the material costing very little. It is well to occasionally encourage the pupils by selecting some of their most perfect modeling to be multiplied by casting in plaster. Casts of so many things can be made good use of in every day life, the operation is so simple, so quickly learned and so educational in value, that it should not be overlooked as a minor feature in the course in modeling.

The Barye casts of animal forms (see page 213), of which examples will be found in many of our pictures, are especially useful in the class room. They are examples of the work of the greatest modeler of animals of the modern period of French art, and are especially appropriate to the school room for their fidelity to nature and for a certain amount of breadth of style in modeling which makes it easy for the children to reproduce them. In some cases, the partly finished forms afford good illustrations of how they should be blocked out. The young never tire of these noble and interesting shapes.

Architectural Models.—These plaster models, represented in the illustrations on page 184, will be found very useful for a variety of purposes in the schools. I wish it were possible for a series of them to be placed in every school in the country. They represent five great styles of architecture,—the Doric, the Ionic, the Corinthian, the Roman and the Composite. They are

in perfect proportion with the great originals, and should be studied carefully till the pupils know thoroughly the essential features of each style, their differences and their resemblances.

Illustration 246

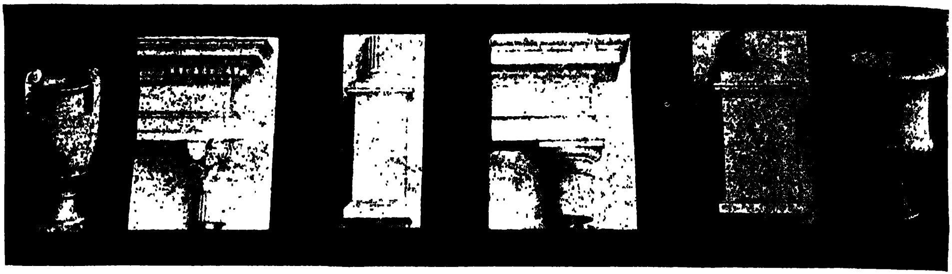


Architectural Forms

Drawing from memory various capitals. These should be drawn entirely freehand.

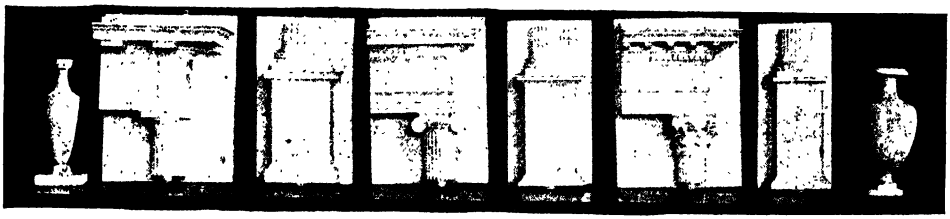
It is good practice to sketch these forms freehand on paper and to delineate them large on the blackboards; to make accurate measurements, and to memorize frequently as many things as possible from them. This knowledge is of great service to all pupils in their after life, whether they become architects, technical workers, artists or tradesmen. It will be found that one can enjoy the appearance of buildings ever so much more, and that one's taste is influenced by properly embodying these forms. The vase forms are classic examples of the best periods, and should also be studied carefully from the models. It is quite surprising, even to experienced edu-

Illustration 247



cators, to witness the admirable effect on pupils in the grammar grades of a little experience in drawing and modeling typical forms of the great styles in architecture. If these units of style are modeled as well as drawn, the pupil acquires a far more intimate acquaintance with their proportions and peculiarities.

Illustration 248



Plaster Casts of Architectural Styles

BOOK THREE

Modeling

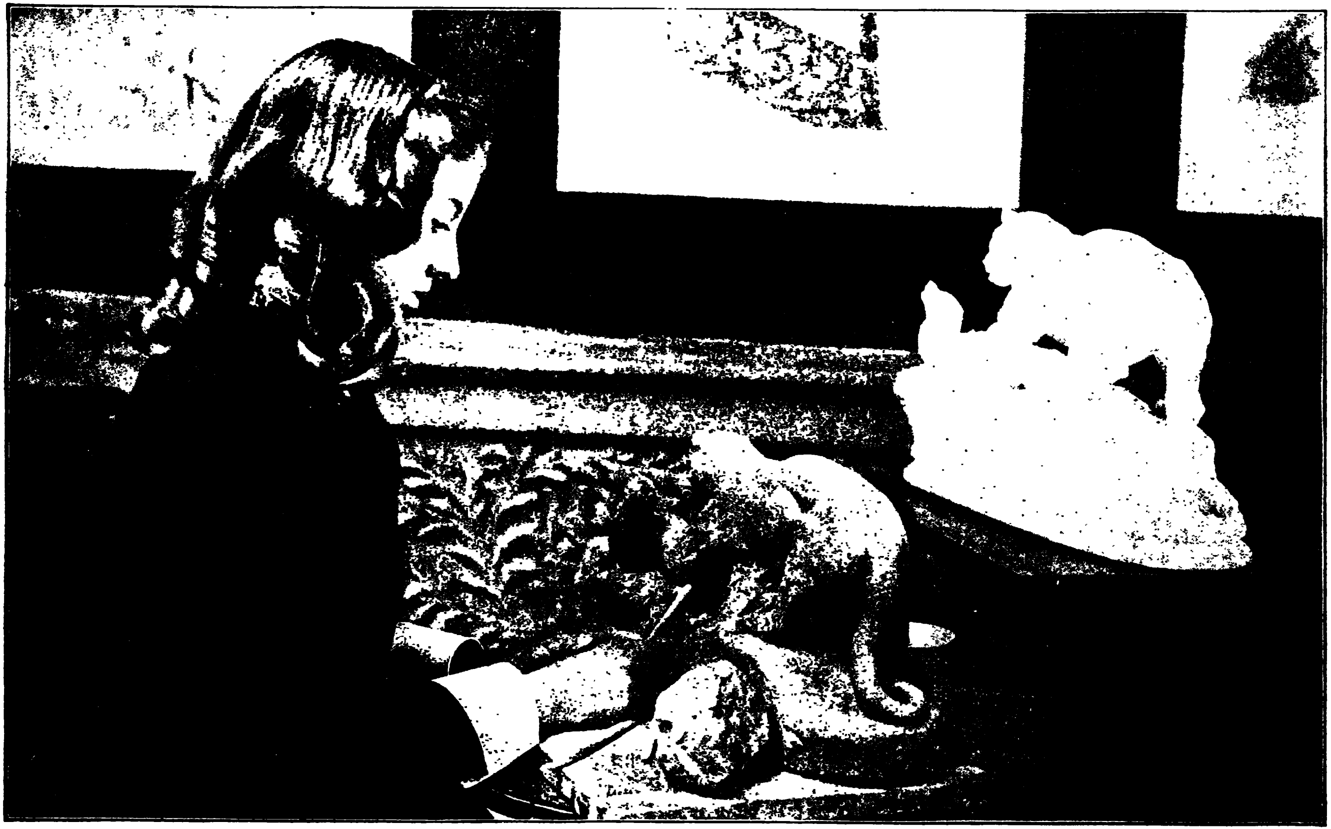
Clay models of real fish made by grammar grade pupils

"Perception and memory should be indissolubly associated. Two errors—to expect a child to remember what it has never perceived, and to allow it to perceive without any systematic representation of the object in memory." [Jacobi.

"Good thoughts are no better than good dreams unless they be executed."—[Emerson.

"Without action, thought can never ripen into truth."—[Emerson.

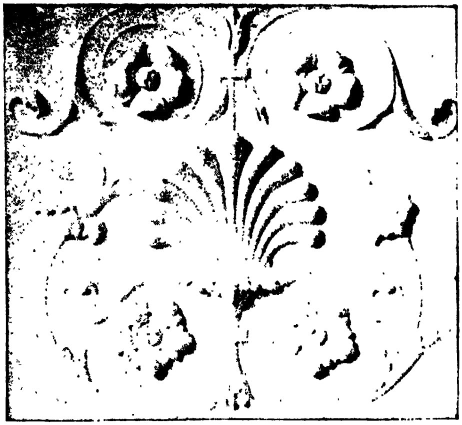
Wood Carving by School Boy



Modeling Animal Forms

This pupil is modeling one of the Barye tigers. These animal forms are especially attractive to children. Being very broadly modeled, they are able to reproduce some ... fidelity. Animal heads are also good for children to model.

Illustration 249



Plaster Model
For drawing, modeling and carving.

CHAPTER I

Introduction, Plant, Etc.*

THERE IS ONLY ONE WAY TO KNOW FORM—that is by making it, not simply drawing it. If we are to know things as they actually are, and at the same time to cultivate an energetic disposition to perform deeds, then modeling, clay modeling, must become a part of educational work. The greatest artists have been the men who have been able to model, like Michael Angelo, Donatello, Cellini, Leonardo da Vinci, Leighton, Gerome and others. All sculptors have to know form, because they have to make it. There are many artists who know form but slightly, and that is the reason some of them fail in their work.

In many art schools modeling is now advocated as a means of teaching form, even for painters, engravers and illustrators, for one may draw the shape of an object many times, and still not be familiar with its appearance all around. This is not the case in modeling, for in this you have to make it all around and touch it all over. A vivid impression is gained through

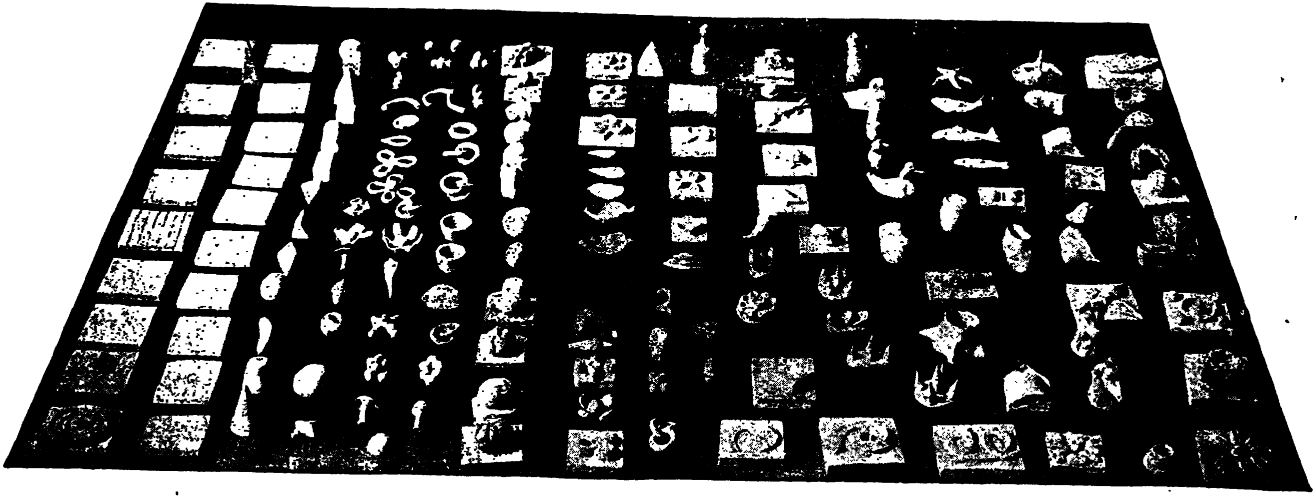
* All the modeled work in the illustrations, and the tiles inserted in the text, have been modeled by the children of the various grades.

the sense of touch and the muscular sense. I have continually spoken of drawing as a mode of thought-expression. In like manner modeling in clay is a mode of expression, only a more thorough mode than any other.

Modeling compels the use of both hands continually. The more we use our hands the more control we have over those organs, and the more vital we make the connection between the hands and the brain. In modeling we use several channels of impression, the sight, the touch, and the muscular sense. All sculptors get a wonderful sense of form through feeling or touch; the most beautiful curves and the most delicate portions of some statues being made by the fingers alone. All bronze and marble statues are first modeled in clay, and then cut in marble or cast in bronze. The actual thought of the artist, the real manipulative work, is always impressed on this plastic medium, that responds to the slightest touch. It is this wonderful "feeling" that enables the sculptor mentally to grasp almost imperceptible variations and gradations of form that are invisible to the ordinary vision. This seeing-power, as it may be called, is partly the result of the tactual impressions on the mind. Touch has been considered by some to be the master sense, one of the first developed, and few realize its importance as a means of training the mind and the judgment. A great part of the knowledge attributed to the sense of sight is received through the touch alone.

In these chapters on modeling I have purposely refrained from grading the work too closely. The elementary forms suggested for little children are just as good for adult teachers or others, if they have never handled clay. The exercises on manipulation of course cannot be attempted by very young pupils. The following lessons may be taken in any order desired, and are chiefly intended to indicate the variety of things that can be made and one way of making them. The lessons are the result of experience with large numbers, and the forms given are some of the best for class purposes.

The Plant Required for modeling is inexpensive. A board 12x14 and about one inch thick, a palette knife to cut and smooth the clay, one or two modeling tools for each pupil, and one or two cups for water for a class are all that is required. Clay can be purchased at any pottery or brick-yard. If it is not convenient to get it at these places, it can be purchased through any art-material store. It should not cost more than a cent and a half a pound, although some dealers charge from three to five cents a pound.



180 Small Forms Modeled in Clay, Suitable for Young Children

Many of the forms were made by the pupils without suggestion. The flat tiles are made, and various simple patterns are drawn and stamped upon them. The forms are not arranged in any special order, but the simplest are the balls and arrangements, next the tiles and rolls made into arrangements, next the geometric and fruit forms. Sixteen life forms are in the series, and all the forms have been made many times by very young pupils. The forms are taken from a large number made by my private pupils, and are suggestive to teachers of modeling. In many schools the geometric forms are modeled too frequently, with perhaps a potato or an apple by way of variety. Children will never tire of the work if they have a chance to vary forms.

It can be purchased in quantity at any pottery for about $20 a ton. This clay, used in making pottery, is very fine, clean, sifted and screened, and is the kind used by sculptors. Clay in some localities is gray, in others red or yellow or blue. The gray clay is the best, but good work can be done with the red, blue or yellow. If possible, however, procure the ordinary gray clay.

Good clay is one of the cleanest mediums of which we have any knowledge. It is antiseptic. If disease germs are placed in the clay and it is allowed to remain in the sunlight to dry, the germs become devitalized.* It brushes from the clothing with a very few touches, and if the pupils are not allowed to scatter it on the floor, when the modeling boards are put away no one need know that clay has been used. The children should be allowed to wash their hands after using it. Like flour in mixing dough, it has a tendency to make the hands feel a little dry in the beginning. This soon passes away.

Many teachers object to the use of clay in schools because they say "it makes a mess." Only in the hands of an ignorant teacher can it do so. No one should attempt to teach clay work who is unable to model. The clay must be in good condition every time it is given to the children. Only an expert, one accustomed to model, can tell when the clay is in good condition. It must not be too hard, it must not be too soft, it must not be rotten, it must be just right. This can be "felt" only by one who himself models. In this series of lessons I propose to illustrate, by means of a few exercises, the manipulation and care of clay, the use of tools and appliances, and then the making of a series of easy, simple elementary forms suited for the very youngest children in primary schools, the exercises increasing in difficulty up to the ordinary work of the grammar grades.

Teachers must not give these series of forms to the children one after

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*The following is an extract from the report of the committee of hygiene of the Philadelphia board of public education as to the value of clay modeling, made in 1895:

"Your committee would urge as a matter pertaining to the health of the children attending our public schools, the most extended introduction possible of the present system of clay modeling, believing that such manual training is in every respect valuable and likely to be followed by the best results to mind and body. As the Director of the Public School of Industrial Art has said, 'No medium better than clay will ever be devised to fulfill the plastic requirements of educational thought-expression, as is witnessed by its universal use in the arts and industries of all nations since the beginning of history.'

"(Signed) Alexander H. McAdam, M. D., Chairman.
"(Signed) Thomas G. Morton, M. D.
"(Signed) William K. Mattern, M. D."

the other in quick succession. Many of the shapes need to be made a number of times, and others of like nature should be given. The series are taken from a variety of forms used in my classes, and with some classes of normal pupils the entire number can be made in a few weeks. Teachers must not cease to remember that the children have several years to become

Illustration 250

Geometric Forms and Bird Forms — Beginnings at Modeling

This picture at the right represents the first attempts of a beginner ten years of age and made at one sitting. First the large rosette, then the starfish, then the rosette with loops and then the small cantaloupe. The hands can be seen making the loop. The clay has been rolled out to about the thickness of a lead pencil and then is bent into position as desired. These pictures illustrate the simplicity of the work and the little plant that is required. Almost any object in the garden or the yard can be modeled.

proficient in this work, and that it is unreasonable to expect fine results at the first attempt. This is a constant failing with some teachers; they expect too much from little fingers.

A Good Box for the Clay.—In constructing clay boxes, see that they are made without any metal or slate lining. There is no substance better than wood or clay. In some schools I have seen zinc-lined boxes and slate, used through ignorance of this fact. Clay will not stick to a wooden surface, it sticks to metal or porcelain-lined boxes like wax.

Any carpenter can make suitable boxes. Of course the form can be modified to suit any sized space in the class room.

I have found it useful to use a case that runs up like a book-case, with shelves that are removable. It should be possible to put the shelves close together or far apart, as desired, according to the size of the work. If the work is on flat tiles, they can be put within two inches of each other; if it forms a large mass, several shelves can be taken out and the work put in without trouble. Doors can be put to the case to keep the work secure. Its lower part may open with lids. This is for the mass of clay, which should be easy of access on account of its weight. A spade can be used to keep it in good condition. The box may be made large or small, according to the size of the class or the number of pupils. A box 5x6 feet and 3 feet deep for the clay part will serve for a class of 200. The clay can be kept moist by means of pieces of flannel or blanket spread over it.

Illustration 251

Portion of the Modeling Room, Public School of Industrial Art, Philadelphia

The room accommodates fifty pupils, five at each table. Eight hundred grammar grade pupils and various teachers' classes rotate into this room each term.

Illustration 252

Making a Ball of Clay

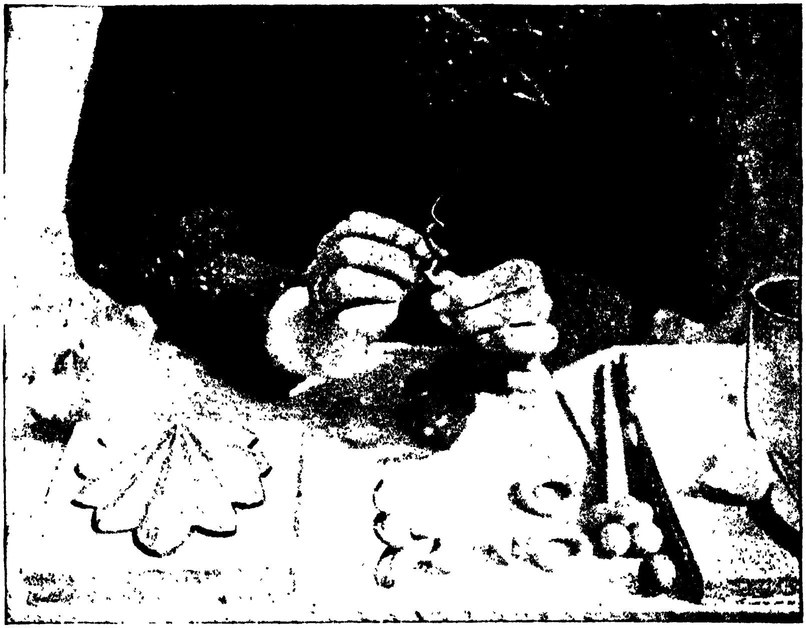
CHAPTER II

Elementary Courses in Modeling

MANIPULATION OF CLAY.—Take a piece of clay in the hand. I want you to learn something about its manipulation. Roll it out between the palms of the hands until it is as thick as the finger and about four inches long. Notice when you hold it by one end that it is limp, and will not stand erect. Now observe that I pinch the clay together and "wedge" it, making it a little firmer in consistency. "Wedging" is a potter's term for soldifying the clay in this way. When I hold it up you perceive that it will support quite a weight, that it is strong. In every piece of work that we make we should endeavor to keep the clay wedged. Now I will take the same piece of clay and roll it out again two or three times on the board or betwen my hands. I rub it out and then roll it out again. You will now see that the clay is no longer plastic, but rigid, and that if I bend it, it breaks. This clay is now "rotten," unfit for use. It has ceased to be elastic or pliable. Do not let children use it when it is of a consistency like this. "Rotten" is the technical name given to clay that crumbles like bread, instead of being tempered and pliable, or plastic. It can be improved very quickly by moistening and kneading over again, and it is then what is technically called "tempered" clay.

The Spiral.—Take a piece of clay about the size of the last joint of the thumb. Roll it out between the palms till it is about as thin as a slate pencil, allowing it to be pointed at one end. Then try to make a spiral (Illus.

Illustration 253



The Spiral

The form shown in this picture and the next is an exercise to test the texture and temper of clay. If the form can be made with a few turns of the fingers, the clay is just in the right state for manipulation.

253). You cannot do this at first, but with a little practice you will be able to do it well. I have had pupils try to make this form for weeks before they succeeded. Others can make it in a few minutes. The more you practice, the more skill you will get. It is good exercise in enabling you to determine the texture and the temper of the clay. When with a single touch and two or three turns you can make this form so that it will stand erect, and remain without falling, it shows that you can manipulate the clay when it is just at the right temper and texture. If it is a little too hard it breaks in a most

aggravating fashion. If it is a little too soft it does not stand up. There is a happy medium, and the sense of touch must become educated until it can feel the proper quality and produce it without any trouble. If you find that the clay breaks, put it to one side and try another piece. Do not use the same piece twice. When you can make a good spiral, you understand the texture of the clay.

Leaf Forms.—Take a piece of clay about as large as the last joint of the thumb, and roll it out in the palm of the hand until it is spear-shaped or resembles a spear head. Now take the form between the fingers and thumbs, as illustrated in 254, and beginning at the tip, with both hands make

Illustration 254

Leaf Forms

Exercise for manipulation of clay.

a leaf form. This is a little difficult at first, but with practice each pupil can make a midrib, show each of the veins and the serrations on the edge of the leaf, leaving it thick in the center and thin on the edge. At first there

is a tendency to break and crumble the edge, but when it has been attempted a few times the fingers will respond and a very good leaf will be the result. This is a good exercise in manipulation. It compels the use of both hands, and the complex form is the product.

Circular Forms.—Take a piece of clay about as large as the thumb and roll it out between the palms until it makes a good, slender roll about four or five inches long. Now bend it and make both ends meet till it forms a ring. Then by the use of the fingers alone manipulate the clay so that the joint will not show and so that the ring is true and even all around. This is another good exercise, and one that requires skillful handling. It is still more difficult to make another ring interlacing with this one.

Illustration 255

Moulding a Circular Form

Hints to the Teacher.—When the children are making these forms do not allow them to break the clay in pieces; let them keep it in a lump except the portion they are using. Allow no crumbs to fall about the board, the desk or the floor. All the pieces must be put back in the main lump. If they are rotten, they can be placed at the left by themselves. From the very beginning, resist the tendency of the beginner to "make a dirt." In a few lessons it will be found that pupils can model elaborate and complex forms without dropping or scattering the clay at all. It is simply a habit of neatness that must be taught, and if insisted upon from the beginning there need be no trouble with the "propensity to make dirt" that is wrongly attributed to clay-work.

When the children begin to make good forms do not allow their work to be destroyed. Place all pieces made on a shelf to dry. Then if they are not kept permanently, they can be sorted out, the good ones given to the pupil to take home and the bad ones mixed with the main mass in the clay-box. The same mass of clay can be used for years in this way, and continue perfectly healthful and free from any odor. Never allow the clay to remain for long periods in a damp state unused. If it is not to be used for a few months, permit it to dry. It can readily be moistened again when

required. The damp from the clay yields a musty and moldy odor which is not pleasant. If the clay is constantly used, it will keep fresh and sweet indefinitely. Covering with a moist, clean cloth will prevent drying.

Do not attempt to keep the clay in a crock or a tin vessel. A wooden box is far better. I have clay boxes in some of my schools that have been in use for fifteen years, and except that the bottoms are a little decayed, they are as good as new.

Tiles and other unfinished work should be kept on wooden shelves in the clay-box or closet. If possible in the class room devoted to modeling, shelves or ledges should be put around the room, on which finished work can be placed. In this way in a very short time the rooms

Illustration 256

First Exercises, Making Balls, Rosettes, etc.

can be decorated with creditable work produced by the pupils. This is inspiring to all and makes the place look like an art workshop.

Elementary Forms.—The following are suggestive of the simplest forms that can be made from clay without the use of tools, for the most elementary classes. Make some balls, by rolling the clay in the hand, about

the size of a large marble. Groups of these can be made. Make groups of three, groups of four, groups of five. Make a pyramid, make a star, and so on. Children of six years of age and upwards take pleasure in making these forms.

Illustration 257

First Exercises in Modeling

Other forms can be made by taking a piece of clay and rolling it out about as thick as a lead pencil and about four or five inches long. Make a little loop. This can be combined with others, making the following forms. (Illus. 257.) Little rosettes can be made by adding a center. Do not let the children make crumbs or pieces. Instruct them continually to keep their clay together and see that it is in perfect condition. It must be quite soft for very little fingers, and still not soft enough to stick. Make no attempt to do anything with the clay when it is sticky. Disgust is sure to follow if it is handled in that state.

Many simple rosette forms can be made. Make a form about the size of a small marble and then press it till it is nearly flat. Make a little disk or center. Combinations of these can be made. Make the

same form a little pointed at one end. A large series of rosettes can be made with the addition of a little ball or boss for a center. Bend the leaves up, make them cup-shape. Make some with points. With some thought an endless variety of these forms can be devised which will give a great deal of pleasure to the child and variety to the lesson. Be careful not to let the children tire of any of the forms. A teacher of course can make one of these forms in a half-minute, but for very young children two or three of the forms are quite sufficient for one lesson.

A number of natural forms can be made. Roll out a piece of clay into a ball, about the size of a marble. Press it till it is nearly flat, make a little stem by rolling out another piece, and we have a very good imitation of a mushroom. Bend the top over the stem a little and stick it on the board in a standing position. Make several sizes, forming a group. Easy fruit forms can be made by rolling out pieces till they form a ball about the size of a marble, then putting long stems to them, making bunches of two and three like cherries. Plums can be made with the small stems.

Animal Forms.—An interesting series can be made from various animal forms. Of course these must be reproduced from memory. It is wonderful how quickly the children grasp the idea of form after a few lessons in making these elementary shapes and how soon they get an amount of detail. But do not expect them at the first few lessons to master detail, since they begin to apprehend this only after they have taken notice of things, through the desire to make them in clay. Do not mind how poor the forms are the first few days.

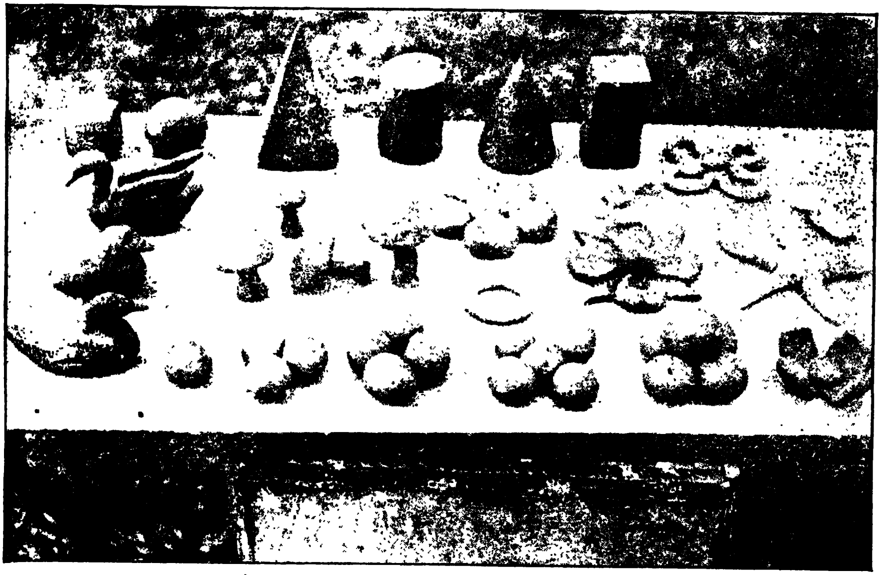
Let us begin with a chicken. Take a piece of clay about the size of a small hen's egg. This will form the body. Now take another piece of clay and roll it in the palms till it is about the size of a small marble. Place this on the large piece for the head. Next add a little piece of clay for the bill, two dots or two little balls for eyes, and a few marks on the side for wings. If desired, a very short tail can be pinched out at the end. This can be made with a few touches to look like a very small chicken.

Next we can attempt a little duck form. This is more complex than the chicken, and can be made about the same size. Make the neck longer and give it a nice curve, make the bill a little longer and thicker. The tail can be made longer, and the wings marked a little more carefully.

A somewhat similar form can be made to represent the swan. It has

a body of the same shape as the duck, rather a little larger, with a long curving neck, which needs to be made separately and fastened on the body. See that there is a double curve in the neck and that it bends back over the body. Give it a nice swan's neck curve. Two wings can be made by

Illustration 258



Elementary Forms in Clay
All of these forms are suitable for very young children, and are first attempts made by beginners.

flattening out some clay, and they can be pressed onto the sides of the body so that they stand out. The result looks much more elaborate, but it is quite as simple to make as the chicken or the duck.

Understand the object of these lessons. It does not matter how grotesque these forms are at the start. The early art work of all races of people is grotesque and their products are often examples of how children should or do draw in the beginning. Very many adults, as well as children, cannot recall the shape of a duck in the beginning, but no one can endeavor to make it from memory without memorizing, he next time he sees a duck, a swan or a chicken, some part that he had never noticed before.

A specially valuable part of the lesson is the fact that it compels one to memorize form. If I am modeling a frog from memory, and do not know the number of toes, I may make three, four or five, but the next time I see a real frog I will satisfy myself on that point and fix that knowledge so firmly in my mind that I am not likely to forget it.

Usually I do not tell my children details of this kind. I prefer that they should learn the truth by investigation. Some people do not know how many toes a dog has, or a chicken, or a canary. If they are compelled to draw or model the form from memory, they discover their ignorance, and by observation of the real form they learn to grasp the detail. So it is with little children. At first the forms will be very crude, but when they begin to make things that they have investigated, it is wonderful what an amount of detail they will embody. Remember, these are simply generalized forms. Imagination is the result of a series of impressions. It is only when we have received a sufficient number of impressions through the different sense channels that we begin to be able to represent the essential facts of form. This work I sometimes call compulsory memory work.

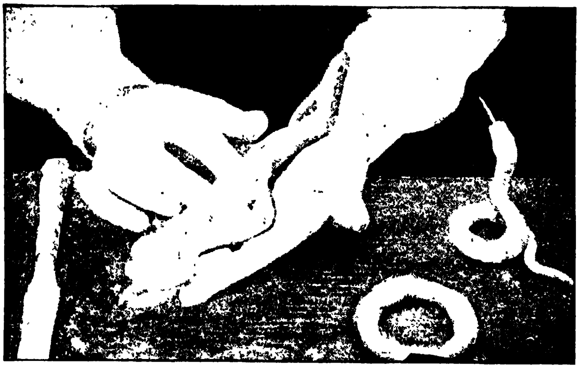
Children should be encouraged to make clay figures of any kind they desire, clay horses or sheep or men and women, like the Mexican toys which imitate these figures. They should be allowed to give expression to their feelings and imagination with the pencil in making horses, buffalo, Indians, etc., ships, war vessels, etc. They will often be found to draw them with the same character and simplicity that the Indians do. They grasp essentialities and ignore details—the first thing desired in good work.

Other Animal Forms.—A starfish is a good form to model. Make the five tapering members first, about the same size, by rolling out to a point, and then join them in the center. Bend the form till it assumes a natural position and make the detail with the tool. Make several sizes of this form. Do not make them so large that they cannot be modeled with the fingers.

A snake about six or seven inches long is very good practice. Roll it out first in the hands and then on the board. Let it taper to a fine point, make the head a little thick, the neck a little thin, flatten the head, make the features, mouth and eyes with the tool, and then bend in a natural position. A good plan is to coil it with the head standing erect as though it

were going to strike. Another good position is to curve it, as though it were moving along the ground. A snake makes a series of beautiful curves in moving, and very nice forms can be made by modeling. Make two or three. In the beginning, of course, only the most elementary kind of forms can be made to suggest a snake, but as the lessons progress with practice the body can be thickened a little in the middle, tapering to the tail, scales can be modeled, a forked tongue can be placed in the mouth, and so on. Children are fascinated by these small living forms, and after a few attempts grasp many unnoticed details.

Illustration 259



Modeling the Snake

The fish form is one of the best of all shapes to make. Roll out a piece of clay about the size of an egg till it is a little pointed at each end, flatten slightly between the two hands, then add the pointed tail, making it quite sharp and thin on the edge. (Illus. 261). Let the body be thick in the middle and taper to the tail. Make the two dorsal fins thick near the body and tapering to a thin edge. Do the same with the pectoral fin on the side, and with the anal fin underneath. The gills can be marked with the tool and the eye can be pressed in with its point, or a little ball can be made to represent the eye, stuck on and then modeled. The mouth can also be made with the tool.

There is an endless variety of beautiful fish forms. In making this elementary fish form, however, a very simple shape can be selected, a generalized fish, or a typical fish form if you wish. A very realistic effect can be made by putting the rays and spines on the fins and tail with the tool. The scales can also be marked, and if the fish is curved a little it will look quite realistic. Numerous pictures of modeled fish ocur in this work.

A small frog can be made. Take a small piece of clay, roughly shape it with the fingers about the size of the body of a medium-sized frog. The mouth can be made with the tool, two little balls can be stuck on for eyes.

the rough places on the back can be modeled with the tool, then the two hind legs can be made. Make the legs bent in the position of a frog sitting down. Then make the two little fore-feet with smaller pieces of clay, adding the toes last.

Next make a small turtle. Do not mind if some of the children have not even seen a turtle or cannot recall the number of feet it has. Make the body about the size of an egg, flatten, cut the division between the two shells with the tool, make the cavities for the four legs, a cavity for the head and another for the tail. Make a pointed tail, make a head something like a snake's head, partly flattened, and then the four flippers. Of course the teacher should be able to make each one of these forms quickly as a suggestion to the class, giving some idea of the size, and as much detail as possible. The pupils, however, are not to copy this model. They can look at it and recall the mental image, as far as they have gained one, of the turtle or tortoise.

A lizard makes a good form to model. Roll out the body just as we

Illustration 260

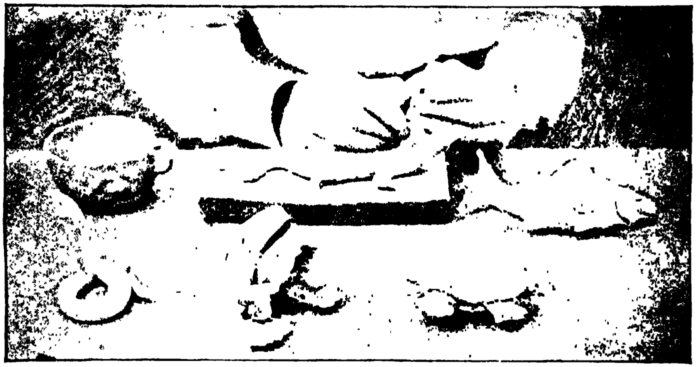
Modeling Various Natural Objects

form the body of a snake, make the tail taper to a point, make the neck a little thin, flatten the head, form the mouth, eyes, etc., with the tool. Then the legs can be formed by smaller pieces of clay bent and added onto the sides.

A little mouse can be made. Model the body, then add the long tail, the two ears, make the detail with the tool. If desired the feet can show peeping out from beneath the body.

These small life forms are suggested because children are especially fond of them, and although the product will be very crude at first, impressions are being made that cause the children to become very attentive to the forms when they meet with them again. Their ideas unconsciously become clearer and more vivid. Remarkable instances of observation of detail will constantly be made by pupils from particular forms that interest them.

Illustration 261



Elementary Modeling of Animal Forms

Vessel Forms.—A good exercise is to make a little vessel form. Take a piece of clay about the size of a small egg, press it in the center till you form a cavity, bending up the edge all around at the same time with the fingers, till it forms a hollow, cup-shaped form. (Illus. 261.) Do not let it become flat like a saucer. Make the base by pressing it on the board, and, by rotating it a little between the four fingers and thumb, it can gradually be made small and cup-like. Do not let it be thick and thin in places. Smooth away the little hills and hollows, and resist the tendency of the cup to spread out. Let it be about 1 inch or $1\frac{1}{2}$ inches in height and perhaps 2 inches in diameter and about $\frac{3}{8}$ inch thick. This is a splendid exercise for manipulation. Work with it till the rim or top is a good circle. Let the

base form a true circle. This requires a little more manual dexterity than one would think to make it good in shape. Endeavor to make the inside smooth and the rim a nice flat edge all around. Make different sizes. With a little practice small vessels for various purposes can be made,—little basins, bowls, vase forms and so on. If these forms are allowed to dry, they can be fired and glazed in any pottery for a few cents each. Beautiful little vessel forms suitable for pin trays, flower receptacles, salt cellars, match safes, etc., can be made.

Next take a piece of clay a size larger than that used for making the cup, and make a small shoe. The pupil can imitate a wooden shoe, or slipper or boot. Press in the cavity for the foot with the thumb and fingers. The point can be made to turn up, in the usual manner of a wooden shoe or Turkish slipper, or any other shape can be made as desired. Draw the attention of the children to the fact that the foot is wider in front than at the heel, and so on. It is wonderful what a variety of shapes the children can make after a few lessons. They will put rosettes of different kinds or buckles on the front, and sometimes make the shoe to button or lace. It requires the merest kind of suggestion to make the children observe in a very little while all kinds of shoe shapes, and to reproduce them. That is the object of the lesson,—to compel observation. A very good plan, if the children are making realistic shoes, is to draw attention to their own. Let them look at the foot and the shoe. Let them see how narrow it is at the toe or the instep. Let them look at the shape of the heel. This form also makes a nice little receptacle for pins or flowers, if fired. Allow the pupils to keep it when it is satisfactory and is not too rough.

The next form may be a bird's nest. Take a piece of clay, roughly shape it by making the cavity with the thumbs and fingers, working it around in the hands until it assumes a cup-like form. Now place it in the middle of the desk or modeling board, and with the tool make the ragged edge. Try to imitate the texture of the sticks and grass, and then bend the edge over till it is about the size of a nest. Do not let it be too regular, make the form irregular. Allow some pieces to stick out in an accidental fashion. Three, four or five eggs can now be made and placed in the nest. Be sure they are of the same size. (See Illus. 260.)

Take a piece of clay and make a rough tree stump. Pull up the edges to form the ragged stem of the tree. Let it be hollow and cup-shaped. Let

the edge be very irregular. Pull out a few roots, or model one or two more pieces of clay and add them for roots. Be sure they stick on, and that the clay is incorporated with the main mass. Do not simply press the piece on, but incorporate it with the tool so that when it is dry they will not fall apart. Do not make the roots or rootlets look like legs. Let them be irregular, one on one side and two or three on the other. Make the texture of the bark with the tool by a series of short, irregular marks. This also forms a very nice little receptacle for flowers, pins or matches.

A small basket may be made. Take a piece of clay, press in the center, making it hollow, and raise the edge; let this be about as thick as the cup form that we made. The basket can be made square, oblong, or elliptical, as desired. Roll out a piece of clay, bend it over, make a strong handle. Do not make these handles too thin. In modeling never make anything thinner than the handle of a small teacup,—a fine China teacup. Anything smaller than this is sure to break with handling. The texture of the basket can be imitated with the tool. This makes a nice receptacle for various purposes. All of these forms can be placed on tiles, slabs or plinths.

Illustration 262

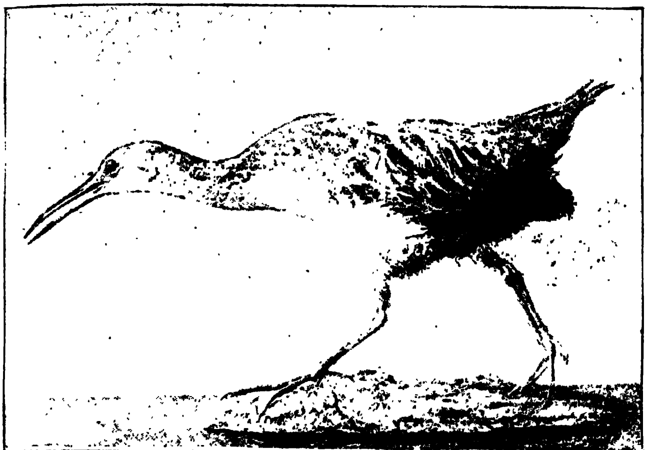
A Modeled Tile

The pupil has completed the design in clay and is now trimming the uneven edges from the tile.

In making a tile (Illus. 262) take a piece of clay, press it in the center of the modeling board, then take another piece and add to it, incorporating one with the other. Do this continually, turning the piece of clay and pressing it flat till it is about the desired size. Do not allow the clay to stick to the board, fingers or tool. When you have a rough piece made about the size or a little larger than the size you desire, take the knife and flatten it. Keep turning the tile continually and give it plane surfaces by pressing it against the board with the knife. When it is flat enough and of even thickness, draw with the point of the knife on the top the size of tile you desire. It can then be cut with the end of the knife blade. Do not cut with the entire blade of the knife; use the end of the knife and let it pass

through the clay so that there is little friction. (Illus. 262.) When the children have a little more skill and desire to keep the forms they make, it is a good plan to mount them on tiles,—the animal forms, the fruit forms, rosettes, etc.

Illustration 263



Modeling in Clay from Birds

The panel below has been modeled, from the real bird shown at the left, by a pupil of the grammar grade. It is quite a good tile for such a young pupil. Perfection must not be expected from the children, especially when they have had but little experience. But the eagerness with which the children strive to faithfully imitate nature, and their enthusiasm over this contact with the real thing, are by no means the least valuable characteristics developed in the young by the natural education.

The Real Bird

Directions for modeling birds from the real, or other animal forms, are given in Chapter VI of this section. Work of this kind is much more advanced than the elementary exercises in this chapter.

The Clay Model

In making these elementary forms simplicity of work is one of the things to consider. Remember, the entire work is chiefly to compel the children to think of and to memorize form. Children instinctively endeavor to give expression to thought in all directions. The mind is worked upon and developed through the senses by externals, and it is to compel this union of thought and action that we make these seemingly trifling exercises.*

* *Ideas* are, on the efferent or motor side, nascent movements—that is, intuitions of such movements as have been performed; on the afferent or sensory side, they are images of the sensory impressions which have been experienced, the revival of such sensory impressions on the occasion of a suitable external stimulus being *perception*.—Maudsley, Physiology of Mind, page 443.

Many adult minds are paralyzed or wanting in certain directions at maturity. Never having been required to perceive accurately, they do not remember correctly, and so they cannot judge soundly or imagine truly. As I have repeatedly quoted, "accurate perception and exact memory are the fundamental bases of sound reasoning and imagination." Do not be troubled if the results are not artistic. They are sure to be pleasing to the children, for children are like savages in some of their stages of development.

Many people speak of the necessity of art atmosphere in the school room, and in some places or cities fragments of the antique,—statues like the Elgin marbles, the frieze from the Parthenon, the Venus of Milo, etc., —are placed in the school room.

I find, however, that these forms do not impress the children. I would rather see the same money spent on natural forms—real butterflies, birds, fish, shells, good specimens of minerals, etc. We must make the children love nature at first hand. We must inoculate them with the desire for beauty through the real living forms in nature. Then, later, we can expect some result when they come in contact with the great art works,—the thought of great minds expressed in concrete forms. But it is useless to put before their eyes the perfection of Greek art unless we first give them the hunger and thirst, the vital love for beauty as it is exhibited in every natural flower, leaf, and shell, and in the various living forms that attract and fascinate the young.

Various Leaf Forms, Models

Illustration 266

Clay Modeling
Modeling original designs on a curved surface. Grammar grade children.

CHAPTER III

Modeling Fruit and Vegetable Forms

FRUIT FORMS MAKE A GOOD SERIES OF OBJECTS to work from. Endeavor to have the real fruit if possible. We can start with an apple. Let the children take up the apple in their hands first and observe its shape. Draw their attention to the stem end, how deep it is; to the blossom end, how shallow it is. Let them continually handle the form, during the lesson. It is good to study the colors of fruit forms. Draw their attention to the beautiful shades and hues of green or red or

yellow, as the case may be, on the apple. Make them aware of the facts before them by speech as often as possible. Take a piece of dry clay and roughly shape it in the fingers. Do not let be too large,—make an average sized apple. Some of the apples will be large and some small, but it is best to choose one of medium size. Do not let the children make any of the forms in miniature. It is very absurd to see a lot of apples modeled by a class, as small as cherries, to see grapes modeled as small as peas or currants, and pears as small as strawberries. In every case let the children make the forms about the average size of real fruit.

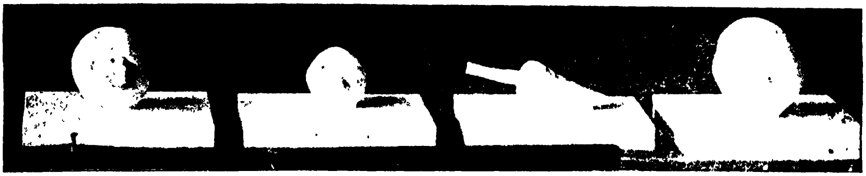
Use the tool now to make the form smooth, working it all over the apple without scraping the clay. Mold it. Do not allow clay to stick to the tool or to the fingers. Be very particular about this. It is a sign of error if the children have clay on the wrong side of the fingers or sticking to their hands anywhere; or if it is sticking to the board, the tool or the knife. The clay must be made compact, by often caressing it with the tool. It is somewhat difficult at first to prevent the tool from scraping the clay, but with a little practice it can be done. Do not mind if the form is a little rough or shows the tool marks, in the beginning. Remember, this is simply to get dexterity with the hands and the tool. We do not care for the product of the first efforts.

Make the cavities at each end with the tool and endeavor to keep the convex curve like the model. One or two little touches with the tool will give the appearance of the blossom end, and then a little piece of clay rolled out and inserted will form the stem. Let it stick to the side of the apple so that it will not break off when dry. There is a great deal of character in the stem of an apple. It is usually short and thick, therefore do not make the stems too long, as is frequently done. It is absurd to see apples with stems almost as long as cherries. Do not let the children use the stem of the real apple in the clay apple, as they are frequently taught. This is simply trickery. Any child able to make an apple will take pride and pleasure in making a good stem to it. The only people I have found who complain of certain of these exercises being too difficult for the children, are the teachers who could not make the forms themselves.

Continually draw the attention of the children to the minor facts of form visible on the apple, and by degrees they will perceive, apprehend and reproduce these forms. Do not, except in special cases, perform the work

for the pupils, but make them consider the form for themselves. It is the idea of an apple that you wish them to assimilate. The clay form or product is not of much consequence. Think of this continually. It is the concept of apple firmly locked into the mind in all its various aspects

Illustration 267



Plaster Casts for Modeling
When the real fruits or vegetables are not available.

through the senses that you desire to produce. It is a very good plan at the end of the lesson to let the pupils, if the lesson has been satisfactory, actually assimilate the apple and test its gustable qualities. This adds to the permanent impression, remember, and is a very good lesson, and one that is usually enjoyed. It will do no harm to speak of the structure and the texture, the color and the taste of the apple at this stage.

Illustration 268

Vegetable and Fruit Forms for Modeling

Another point to speak of before we leave the apple is, not to allow the children to make freak forms. Usually in a large number of apples there are one or two that are very much distorted. Draw attention to the typical apples. It is not necessary in the beginning for the child to make

all the accidental kinks, creases or curves that are on the apple. It will b sufficient if they make a good generalized form in the beginning.

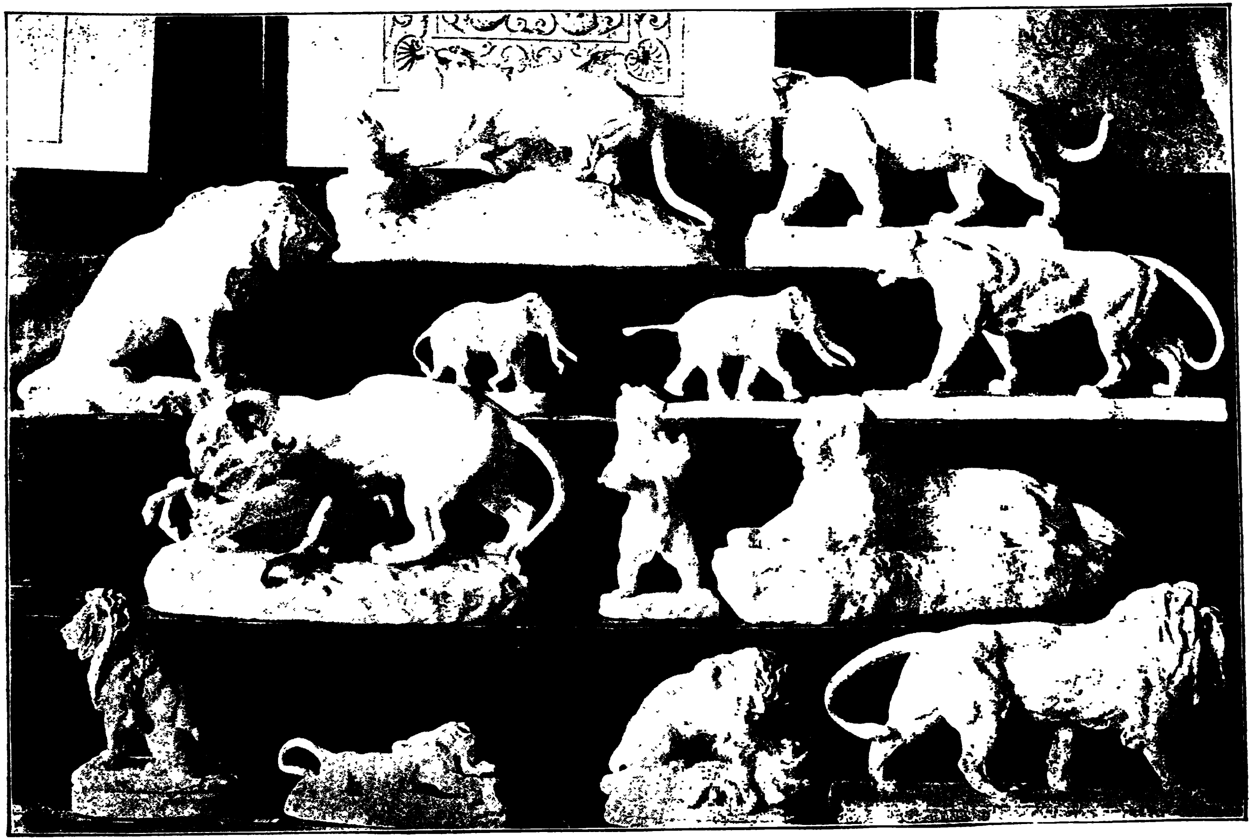
The Pear—Is more complex than the apple and requires a littl more thought and care. See that the pupils have good models, nicel shaped pears. It is better to have a few good ones for the class, even they cost more, than to give out a lot of poor shapes that are perhaps cheaj Take a piece of clay, roughly shape it like the pear, depressing it at on end. Use the tool to smooth the surface, as described in making the appl always getting the main form of the pear first with the hands. Do nc make the forms too large. It is the tendency with all beginners to exag gerate the size.

Do not hesitate to take the tool in the left hand continually. It feel very awkward in the beginning, but in all modeling the tool has to be use sometimes with one hand, sometimes with the other. Later on, in larg forms, the tool is held a great deal with both hands. Notice that the blos som end is not so deep as in the apple, that the stem end has a distinc character, and that the stem is usually a little longer than the apple sten Of course there may be exceptions. Notice also the difference in color c the pears and in the texture of the skin, some pears being quite rough i texture, others smooth.

With a little practice texture can be imitated very successfully. Th smooth chubbiness of a tomato can be rendered; also the texture of clotl velvet, fur, and so on. Of course at first the children can not try for any c these qualities. I simply mention them to show the possibilities in clay, i being the most plastic medium of which we have any knowledge, and on which, for that very reason, has been used by sculptors from the beginnin of history.

Hints to Teachers.—Make the children handle the model, let then look continually at it and compare it with the one in their hands. Invit them to observe other pear shapes, show them the typical ones from th number that you are using. By this time you will find that the childre are unconsciously using either hand and that they are actively busy with th touch, the vision, the muscular sense, in the work of assimilating impres sions. In doing this work, also notice that they are overcoming awkward ness, for at first, when the tool is used in the left hand, it will feel and lool very awkward. That, however, is soon overcome.

PLATE FIFTEEN



Some of the Barye Casts

The modeling is bold and broad. They are beautiful models for children to work from in clay and also for drawing in pencil and charcoal. These forms are used in all my various classes.

It is habit only that compels the arbitrary use of the right hand in many operations; and the habit of using both can be just as easily taught.* Parents begin the wrong way by compelling children to "take the spoon in the other hand, dear;" to hold the pencil or fork a certain way; to change the scissors if they happen to pick them up with the left hand. Surely it is good to be able to cut with one hand as well as with the other. I have never yet found a doctor, dentist or scientist, or skilled user of instruments, who does not agree with this. In fact, they say that to be able to use both hands is a very valuable capacity.

The Banana.--Take a piece of clay, roll it out, make it four or five inches long. Some bananas are very large, but the large sizes are difficult for the children to handle. As we have learned by experience, the medium sizes are the best for practice. Try to make the planes by drawing the tool or the finger from one end of the banana to the other. Sometimes they are four, five and six-sided. Try to grasp the character, to apprehend the main forms. The shape is a little difficult to make at first. Draw the attention of the class to the color aand other characters. Other forms that can be made are the peach, the lemon, the plum, the grape, and in fact any available fruit.

Fruit Tile.—A good lesson and a very simple one is to model a tile with a branch of fruit forms on it, making the twig, the fruit, the stems and the leaves. Make the tile about eight inches long and about four inches wide. Do not trim the tile till the fruit forms have been modeled. If you trim the tile in the beginning the edge will be scarred or marred before the form is finished, and then it has to be trimmed again. Leave that for the last thing to do. Take a piece of clay, roll it out about the size of a lead pencil, about three inches long. Shape the end of the branch, allowing it to be a little thick at the lower end and tapering to the top. Place this in position on the tile. Then add another piece about the same length and also tapering, and bend it to form the shape of a branch or twig. Continue this from one end of the tile to the other.

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* Habit—self-respect, self-help, application, industry, integrity, all are of the nature of habits, not beliefs. Principles, in fact, are but the names which we assign to habits, for the principles are words, but the habits are the things themselves--benefactors or tyrants, according as they are good or evil. It thus happens that as we grow older a portion of our free activity and individuali y becomes suspended in habit--our actions become of the nature of fate, and we are bound by the chains which we have woven around ourselves.—[Smiles, Self-Help, page 404.

Next make one or two branches. Make these branches fork out in a realistic fashion. Be sure the clay is thoroughly incorporated with the main branch. Use the tool to do this, also to incorporate the stem or branch on the tile. A few little digs with the sharp end of the tool will unite them and then the marks made can be removed by a little modeling. Imitate the bark of the cherry tree on the stems or branches and allow the branch to bend up in one or two places. Next make two or three cherries of the natural size. Place them in position to form a group. Then make the stems; let them be of the right length, 2 inches or 2½ inches long from the cherry to the branch. The cherry stems of course must be made much thicker than they are in nature, about as thick as the handle of a very fine teacup. It is a little difficult to incorporate these thin stems to the main branch and to the cherry without breaking, but with a little practice it can

Illustrations 269-271

Casts of Leaf Forms

be done. Bunches of three cherries can be made, placing one on top of the other two, and the stem placed in the same way. Make one or two bunches of cherries, as desired.

Lastly, make leaves as described in "Elementary Modeling," and endeavor to get the fine points, the serrations, the midribs, and other features with the fingers before placing the leaves in position. Bend each leaf so that it will look as natural as possible. Allow the edge to curve up in one

or two places. Make several leaves in this way. Cherry leaves are long and slender, two, three and four inches long and about one inch wide. Place the leaves in different positions to see the effect before incorporating them. This is quite important.

Make a Composition.—Four or five leaves will be enough for this small tile. Then take a tool and incorporate the leaves carefully with the branches and with the background of the tile. See that they are well supported underneath. If necessary, block them up with clay so that they have a solid backing connecting them, though invisibly, with the background. Allow the edges of the leaf to be quite thin, but let the body of the leaf be thick and strong. A leaf can be made to look as thin as paper by making the edge sharp though it really may be half an inch thick. Allow the leaves to curve naturally, and do not place them at regular intervals. It is a little difficult at first to prevent their looking like pieces of tin. This is a very good exercise for young people, because even though it is roughly done, the product usually pleases them.

An apple with a branch and several leaves on a tile is a very good exercise (Illus. 272). Make the tile first, then the apple, as described in our first exercise; place the apple in a natural position on the tile. Then incorporate it so it will not drop off when the clay dries. To do this, press part of the apple firmly into the tile, and then remodel with the tool the parts marred. Next make the piece of branch of the apple tree about three inches long and place it in a natural position near the apple, making the stem reach the apple.

Next model a few broad simple leaf forms and attach them in a group to the branch. Take care to make the leaves look as natural as possible. Let them be thick in places, and where the edges show, allow them to be sharp to suggest thinness. To give strength make all the parts solid that cannot be seen. Never attempt to make things too thin in clay, like leaves or stems or twigs. It is better to make them solid down to the slab, rather than to have them so thin that with a touch or two in handling they break. Try to show the curved surface of the leaf and the serrations with the tool. It is a very good practice in composition to arrange these little groups.

Two peaches, with branch and leaves, also make a very good exercise. Make the peaches on the tile first, side by side. Next make the

branch and then the leaves. Try to grasp the character of the leaf forms and the arrangement.

These exercises are very good in learning to fit form on a surface, and also for giving the children a great deal of pleasure. For these forms, of

Illustration 272

Modeling Fruit from Nature

This picture illustrates another child modeling an apple on a branch, with leaves, from the real form out in the open air. The table is a box with a board upon it; two modeling tools and a knife only being used. First the tile is made, about seven inches square, then the apple is modeled in the hand. As soon as it is the right size and with a certain amount of finish, it is incorporated on the tile in the usual fashion; then the stem is made, and lastly the leaves. It is very good practice making the character of the branches; they are quite rugged and have distinct textures. The same is true of the leaves; the apple leaf is a broad one and finely marked. In making a tile like this, the leaves can be made solid, then the edges can be slightly raised and undercut.

course, models may be used. If you cannot secure the real fruit, stems and leaves, casts can be purchased at a very low price. The teacher should have models of this kind that she has made from real forms herself to show the pupils.

Vegetable Forms.—Let us begin with the potato. A potato has a rough, irregular shape, but still it has its own essential character. Have the

children make a typical one; take away the unreal shapes. Make the eyes of the potato with the tool. Let them study the model in their hands, and draw their attention continually to facts. Do not let them miss any of the characteristic features of the potato. The form will stick in their minds when they reproduce it with the tool. I cannot resist the tendency myself when I am talking to my class to interject a stream of facts and fancies about the forms we handle. Splendid ideas can be grasped if the teacher is awake. It need not be a lesson in modeling only, but in many other things. The surface texture of a potato is quite different from that of fruit. Make the children apprehend this. But because potatoes are familiar forms and easy to get, do not tire the children with them. Lead them to appreciate the tints or coloring of the potato.

The carrot is a little more complex. Do not let the carrot look like a parsnip or a radish. Let the form be of a handy, medium size, and make the texture marks with the tool. See that the children apprehend the texture. Do not let them make simple cuts or jag marks. Give them a little time to grasp the detail. Have them handle the model as much as possible, since much information is conveyed to the mind through the touch. Do not try to model the top or the leaf part of the carrot. Let it be cut off, just showing the stem. This can be modeled with the carrot or added on.

The Tomato.—Take one that shows the typical form. Some are very much distorted and some do not have the features clearly marked. Make the divisions with the tool. The stem end will be found a little difficult. Have the children make the leaflets separate and add them on. It is difficult in making the ridges to prevent the form from looking like a little cantaloupe. Do not place the ridges too regularly. Use the tool as much as possible in making the texture. It is very smooth and gives good practice.

These vegetable forms may seem trifling in their value as a mode of compelling thought, but very few adults realize the shape of even the most ordinary vegetables, simply because they have never consciously assimilated through the different sense channels all the facts about them. Their imagination is not vivid because their impressions have not been distinct or clear. The slight percepts that they have fade away, and it is surprising to find how many pupils there are even in adult classes who show that they have not the beginning of an idea as to the shape of an egg or a grape, if

they are requested to shape it without the model. We can create talent and capacity in the dullest people by teaching them observation in this way. There are plenty of people with good eyesight who go through the world

Illustration 273

A More Complex Form for Modeling in Clay

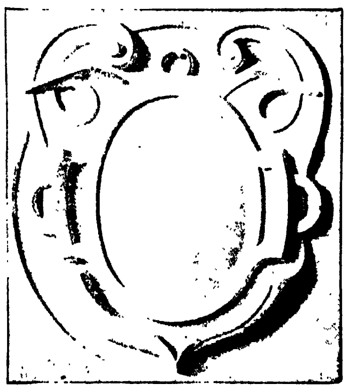
It is wonderful with what fidelity the children may reproduce even a whole branch in clay, with all its fruit and leaves. One work of this kind will impress the pupil with many of the fascinating lessons Nature offers so bountifully. When an important composition has been well modeled, it should be fired, and may also be multiplied by plaster casts.

without seeing anything, and there are many with very poor eyesight who, aided by observation, notice many things. Modeling compels observation, perception, reflection and conception.

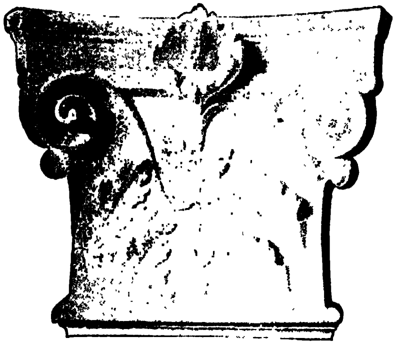
The Turnip.—Make a medium-sized one, pinching out the root and modeling on the opposite end a part of the leaves. The variety of form we have among root crops is wonderful, and it is by receiving these vivid impressions, through making them, that we are fully impressed. The texture, structure, color and form of the commonest, simplest vegetables are valuable as lessons, if we can organically and permanently register them without wasting the time and energy of the pupils. Some turnips have

beautiful tints of color and shading; some are a little rough in texture, and others, like the Swedish turnip, are quite smooth.

Hitch on to your lesson as many facts as possible. Do not let the work become drudgery. Many other vegetable forms can be given, but do not let the pupils tire of any one. Give them variety. We all need it to keep our faculties and our interest in trim. It is a natural craving that we have for new fields to conquer. It is not right to teach only a few set forms continually instead of the variety that Providence provides for our special study and delight. The children cannot readily eat the raw vegetables, so that you must make up to them for it by giving them more food for thought, taking extra pains to make the accompanying talk both interesting and instructive.



Plaster Model of Shield



Models of Plaster Capitals

CHAPTER IV

Modeling Geometric Forms

THE SIMPLER GEOMETRIC FORMS can be readily modeled into shape. They are not very pleasing or interesting, but they yield useful and necessary lessons, and in teaching little children this is the only palatable way in which these uninteresting exercises can be served. The child's awakening mind can grasp only what it sees,—an absolute thing, and here we give it the opportunity to grasp geometric form itself directly, not through a needless definition.

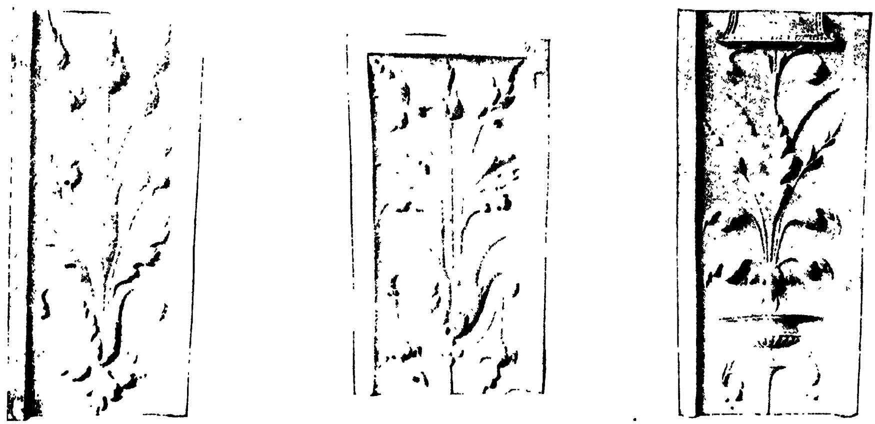
It is wrong to tire the children with these abstract shapes. The geometric forms are essential and necessary at certain stages of education, but to present them continually all through the various grades creates intense dislike. Except for modeling a few times, they should not be used in the early stages. I have known children to be completely spoiled for art work by having these unmeaning forms presented to them so often.

Experience teaches that there is a feasible size for these geometric forms. In some schools they are made very large, and in others much too

small. The best way will be to make the forms of a size that can be readily grasped by little children and made without the use of tools by the two hands alone. Many of the geometric forms can be seen in the pictures in Chapters I and II of this section, also on page 231. They are shown about the proper size they ought to be made.

The Sphere.—Take a piece of clay and roll it in the hands till it forms a ball about 1½ inches in diameter. It is quite difficult to make this a true

Illustrations 278-280



Models of Pilaster Panels, Italian Renascence

sphere, but by manipulation with the thumbs and forefinger, rubbing away the hills and making the rough places plain, and then rolling it between the palms again, a good sphere can be produced (Illus. 252). In making this series of forms it is advisable to have the pupils place the forms as finished along the top of their modeling board or desk.

The Cube.—Next make another sphere similar to the first and of the same size. This can only be done by comparing the two. Place them side by side and take away or add clay till they are equal. Now take the second sphere, and tap it on the board till a plane about one inch in diameter is made. Next turn it over on the opposite side, parallel to the first plane, and make another plane in the same manner. Be very particular to have the pupils endeavor to get these planes really parallel through observation. Let them continually look at the form in their fingers.

Next tap two more planes opposite to each other, and then two others, making the six-sided cube. It is a very good exercise now to make these planes merge together by tapping on the flat board until the form is a true cube, with sharp, clean corners and each plane equal. To do this with any accuracy requires constant attention. Make the children pay attention. This is an excellent form for teaching a number of very desirable qualities. Resist the tendency, especially if there is a large class, to tap the cube carelessly on the board. Be sure that it is grasped correctly, and that the children continually look at the form. Pay strict attention to position. See that the pupils sit constantly erect, keep their heads level and take inspiration.

If they have to look at the cube in their hand, let them hold it up. Do not let them tip and turn the head to look under it. If you wish to see

Illustration 281

Reducing Acanthus Leaf Forms

Antique model. The work is placed upright on an easel, for convenience.

things straight, you must look at them with the head level. Do not expect little children to make very sharp corners or very correct cubes in the beginning. With practice a perfect cube can be made if the clay is in right condition, with sharp edges and fine corners. Any teacher can perceive

that to get these six planes equal in size with the hand and eye alone is good training. To do it a few times is also pleasing, but it is not wise to tire the children by giving them the geometric forms continually, as is so foolishly done in many schools and even in the kindergarten.

In this work of modeling, we are using the master sense of touch, aided by all the others working in unison. This form of representation produces a healthy activity of the perceptive faculties that is valuable. Here we are dealing with form itself, actually making it. We are getting all around our subject and are in this way made conscious of all its peculiarities. We are getting accurate perception, which precedes exact memory, by performing deeds. It is this quality in sculpture which raises it above painting and drawing and places it at the head of the creative arts. It is for this reason that sculptors' drawings often possess those characteristics of strength, boldness of line, truth, which can come only from a thorough knowledge of the subject, gained during many years of contact with form, not simply by looking at it, but by actually making the forms.

We never really know form until we have attempted to reproduce it a number of times in the solid. One of the chief objects of these lessons is to impress this fact on the pupil while studying and trying to make these objects; even though the object is not well made, you are really gaining mental development, you are making these things a part of you to the extent that you gain just perception of the thing modeled. You are assimilating concrete knowledge through several sense channels and must become richer in mind for it.*

The Cylinder.—Take a piece of clay and roll it out between the palms until it is about one inch in diameter. Gently tap each end on the modeling board. Let the cylinder be about two inches in height. It is quite difficult to get the ends smooth and flat in the beginning. If it is rolled too much, a hole will form in the end. Use the tip of the finger or the thumb and fill the hole, and gently pat again until you have a true circle at each end. Resist the tendency to make it too long. If it is too long, pat down until it is short and roll again. Place the cylinder next to the cube.

* "The human brain is an organized register of infinitely numerous experiences received during the evolution of life, or rather, during the evolution of that series of organisms through which the human organism has been reached."—[Spencer.

The Square Prism.—The next operation is to repeat the same cylinder. It is a little more difficult to make this one match the other. Then take the second one, and by tapping on opposite sides, as in forming the cube, make four planes, converting the cylinder into a square prism. Do not make it too long, but let it match the cylinder in size. The chief difficulty will be that it tends to become too long. Keep tapping it, and continually observe each plane, till it becomes a good square prism, then place it by the side of the cylinder. If you have a large class, notice that

Illustration 282

Modeling a Head

This picture shows one position of the hands in modeling a head. The thumbs are "feeling" the form near each eye. Sculptors frequently model portions of the figure with the fingers alone.

there is a tendency to rap the forms on the board without looking at the result. Make the children look to see what they are doing. Do this continually.

The Cone.—Take a piece of clay, roll it out in the hand so that it becomes of a cone-shaped form, and pat it on the end, to form the base. Make

the form in the hands roughly first, and then use the flat board. It must be rolled till it makes a perfect circle on the base. This form is difficult and compels the use of a good deal of manual dexterity. Do not make the cone too high. The tendency with all beginners is to make spear points or little steeples. A great many of the cones used as models have this fault of form.

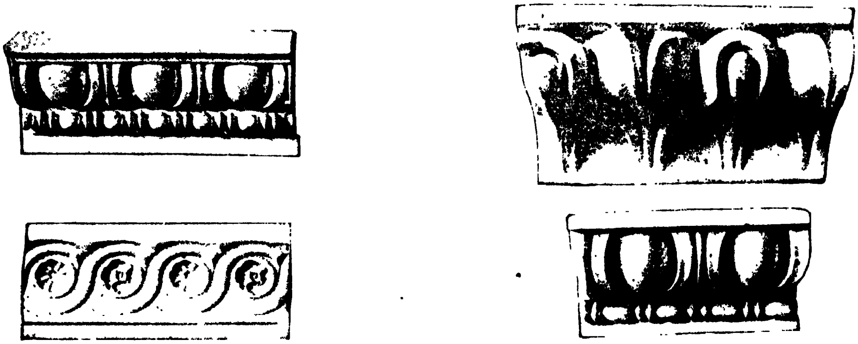
Let the cone be the same height as the cylinder and square prism. As soon as it is finished to your satisfaction, place this product beside the square prism. Then start another cone and make it of the same size as the first one. Notice in making these forms that we have made a pair and turned the second one each time into something else. It is very good practice for gaining size and proportion, to make one like the other. The second cone we will turn into a square pyramid by tapping the planes on the board. This is still more difficult to keep in shape than the square prism or the cube. The base must be a good square, and the four sides must taper to a point and the pyramid must be of the same height as the cone.

Many other geometric forms can be made. The series given, however, will be sufficient to illustrate the process. The forms suggested are the result of many years of experience with numbers of children and teachers, and, if the operations are performed properly, must result in valuable training. Do not tire the children with these forms. Remember continually that they are abstract forms. In the higher grades, when the children are studying geometry, they will have plenty to do with them, but do not disgust them with abstractions, as is so frequently the result in those schools where geometric forms are reproduced year after year till even the sight of them is abhorrent.

Notice that I have made this series of models to present a series of transitional steps, each one a little more difficult, and that the forms can be made without the use of any instruments or tools. Children will take great pleasure in modeling these forms a few times, and that is the reason we give them in the beginning, just as we give blocks to play with. But the essential things are natural forms.

In teaching, never mind the abstractions, continually think of the impression that you desire to make on the mind through the eye and the hand. If the impression is clear and distinct, the form will be clear and distinct. If not, it will be cloudy and nebulous. In talking to teach-

ers, continually speak of the co-ordination of the mind and senses, the tactual, the muscular and the visual, and of the power of observation this work gives one, thus enforcing the acquisition of exact knowledge. Teachers must realize that they are not simply working in clay, modeling common forms in common clay, making "dirt pies," as some ignorant teachers say, but they are molding the human mind, they are shaping the "stuff" out of which immortal souls are made.



Models of Various Borders

A Collection of Pupils' Work, Modeling Room, Public School of Industrial Art, Philadelphia

All the forms have been made by grammar grade pupils. About eight hundred rotate into this room each term. All finished work is kept by pupils. The animal forms are modeled from casts. The casts are kept on high shelves around the room.

A Shell Form for Modeling

CHAPTER V

Modeling for Grammar Grades

IN MODELING THIS SERIES OF FORMS the pupils will pay particular attention to making fine curves, and getting clean, sharp detail and perfect backgrounds,—that is, making the tile of even thickness, with sharp, true edges, and so on. These forms are also good for grammar-grade pupils, and have been tested for many years with thousands of children. The entire series is the result of much care in selecting forms that will do the most good in the shortest space of time. The forms are graded in accordance with their increasing difficulty, and include the elements of the best styles.

The single forms must be made thoroughly well by the children, and then they can be used in combination. It is not necessary for the pupils to make the whole series. As soon as they have grown expert with the scroll

and the leaf, combinations in the way of decorative tiles can be made, using both leaf and the scroll. As soon as the anthemion and scroll have been made, these can be similarly combined. As soon as one of the rosette forms has been mastered, it can be used in combination with other forms. The same may be done with shells, the Moresque unit, the Saracenic unit, etc.

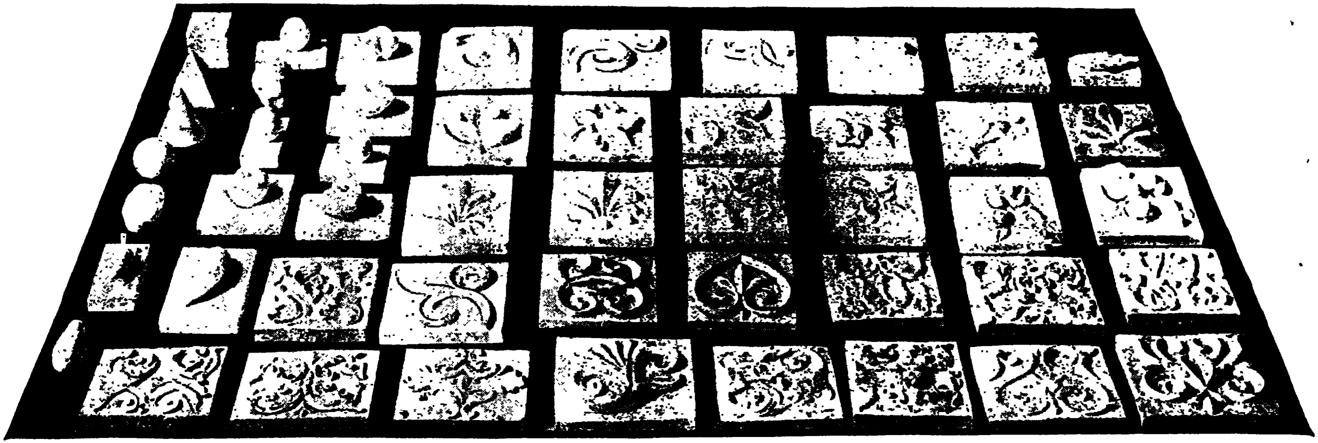
In Making the Scrolls (Illus. 288), build up a good solid tile at least one inch thick and six or eight inches square. Do this with the hands alone, piece by piece, as described on Page 206. Do not allow it to stick to the board. When it is about the right size, make it plain and smooth by means of the knife, but do not trim the tile till the form is finished; let the rough edge remain to protect it. The last thing done should be to cut it square and true when the entire ornament has been modeled. Now take the end of the tool and draw on the tile a good scroll, similar to the one illustrated. Practice doing this many times. It can be rubbed out with a touch of the palette knife. The freehand drawing on the clay surface is excellent practice, and with all my classes, adults and children, in the beginning I invariably have them sketch the form for five or ten minutes freehand, since at first it may be a little too large, then again it may be too small. Illus. 289 shows a child making the single scroll in clay.

Illustration 288

A Scroll in Clay
With another scroll flowing out from it.

Make the scroll so that it fits and fills the space. Let the ball come near the center of the tile. As soon as you have a satisfactory drawing, take a piece of clay, roll it out about two or three inches long and about as thick as the finger, and place it on the drawing. Then take another piece and place it in the same position, continuing until you have the scroll roughly formed with the clay. Next, take the tool and press it into the piece of slab and endeavor to get the curves. The raised edge in the middle of the modeled form is the first thing to get. That is called the "modeled line." Press away the surplus clay and try to swing the tool around the whole length of the curve from one side to the other. Make long, continuous touches. The clay must be exactly right in consistency. If it is too

PLATE SEVENTEEN



Forms Suitable for Elementary Schools

First a few fruit, vegetable and geometric forms, next a series of the various units of design, then a number of arrangements. Some of these patterns are quite elaborate and show fine modeling. The units of design are made and memorized before arrangements.

soft it will stick to the tool. It is better for it to be a little too stiff in the first place than too soft, especially for the tile itself, although of course the harder the clay the more difficult the form is to make in the beginning.

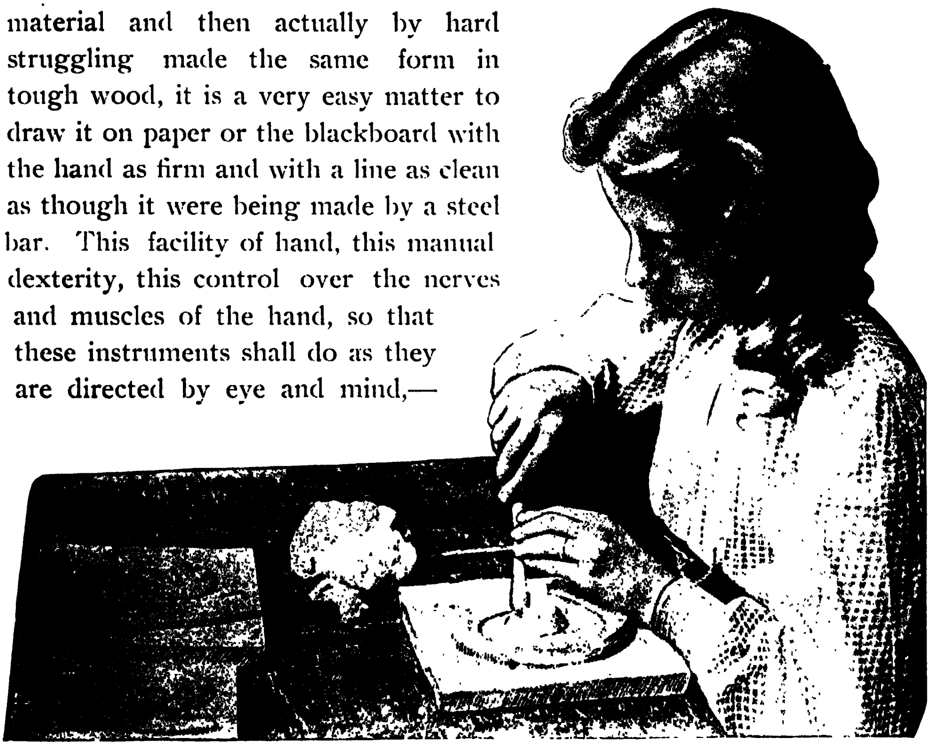
Grasp the tool in both hands as illustrated in most of the pictures showing pupils modeling. Of course the hands move about in different positions as the tool moves. At first it will be quite difficult to sweep the curved end of the tool from one side to the other, making half the circuit or even the whole circuit with a single sweep, but with very little practice manual dexterity will be acquired that will enable you to make a single touch continuing all around the scroll with ease, swinging the tool back and forth on the curve. Notice in doing this that you are actually drawing in material. Do not mind how rough the work is if you can get this swinging movement. Resist the tendency to scatter clay crumbs on the work, keep all pieces in the hand or in the main lump. The form or raised edge must be equal in height all over the tile; do not let it be thick in one place and thin in another. It is quite difficult to get this quality at first. As soon as the curved surface of the scroll has been made, then the form can be clearly cut out by vertical cuts on each edge of the scroll and the surplus clay removed, keeping the tile flat and smooth.

It is not easy to work in the center around the ball, to get into the corners, to keep the edges sharp, at first, but with practice this can be done. Do not mind the tool marks showing at first. We do not want the work finely finished or polished. Try to make the curves as true as possible. Eventually, the longer the swing of the tool, the truer and better the curve will be. Do not let the curved lines look as though they were bent.

This is excellent practice in getting the hands to swing curves, and it is by modeling and carving these forms that we enable our children to draw them with such boldness and facility that it surprises outsiders who do not know of the work they have been through. All our children make these forms. I cannot recall now, among the many thousands of pupils I have had, one who was unable to draw, model or carve these conventional forms if he learned how to do it in this way. Of course if pupils have been allowed only to draw, or to model, or to carve, I am sure many would be unable to draw the forms; but being required to do the three things in rotation, one after the other, they get a manual dexterity that makes the form

organic, and enables the hand in the end to make the form automatically —without conscious thought—as can be seen from the various illustrations showing forms modeled by pupils, where the scroll is shown in combination with other forms, sometimes ten and twenty times over. All the units of styles, and most of the drill form units, are modeled and carved as well. Any one can see what a great help this is in making forms organic. But when we have actually, through the sense of touch, made the form in soft material and then actually by hard struggling made the same form in tough wood, it is a very easy matter to draw it on paper or the blackboard with the hand as firm and with a line as clean as though it were being made by a steel bar. This facility of hand, this manual dexterity, this control over the nerves and muscles of the hand, so that these instruments shall do as they are directed by eye and mind,—

Illustration 289



One Position in Holding Modeling Tool, while Turning a Scroll

Both hands are used and work equally, the tool changing position constantly—sometimes the concave side being used, sometimes the convex. Endeavor to make free swinging touches as long as possible: do not allow the hands to rest on work. In the above picture, one hand rests to enable photograph to be taken.

are among the highly desirable objects of manual training that can never be attained by the limited exercises of mere shop practice. Wood carving is of wonderful value in accomplishing this hand training and character growth.

The Rosette Form.—The next form illustrated (page 235) is the rosette. Make a tile eight inches square, as described before. First draw the rosette with the tool freehand, making it to fit the tile. Make the center of the rosette in the middle of the tile and then the four leaf-like forms one after the other. Do this entirely freehand. Do not make construction lines. Rub out the drawing with the knife and practice the drawing of the rosette several times. Then start with the center boss. Let it be about one inch or one and one-half inches in diameter. Be sure that the clay is incorporated in the tile by mixing the boss with the substance of the tile, so that it will not drop off when the form is dried, then model the surface with the tool till it is a true hemisphere. It is quite difficult at first to swing the tool over from one hand to the other in making this curved surface, but by persisting a little it can be done almost from the beginning.

Illustration 290

A Complex Rosette

Next we make the four leaf-like forms, shaping them roughly in the hand first. Let them be about one inch thick, sloping down to the center or boss, shaped almost like a large tongue. Make all the four forms before you place them in position and see that they are equal in size. When this is done they can be placed around the center boss. Squeeze the forms into position, being sure that the clay is roughly incorporated into the tile. If it is simply pressed on the tile, it will be sure to drop off when the tile dries. All these directions are not only essential to making a good tile, but such thoroughness helps mind and memory.

Remember this: The clay must always be incorporated, one piece of clay worked into the other, if you wish it to hold together. It is very exasperating to make a number of forms and then when they dry up to have them fall apart. This is usually the case unless care has been taken every time to incorporate the clay with the main mass. Each piece as it is put on should be made one with the parent piece.

Now the rosette must be tooled into form. It has been roughly shaped with the finger, and now we take the tool and make the cup-shaped

PLATE EIGHTEEN

Various Positions of Tool in Modeling Rosette and Shell

The tool is sometimes grasped in the right, sometimes in the left hand. The hands must swing freely over work, care being taken not to make small patches or pieces.

hollow on each leaf with a single stroke if we can. Pass the tool over the surface of the leaf many times and then over each of the other leaves. Do not turn the tile.

The object in this exercise is to make the four leaves in four different directions while the pupil keeps the same position in relation to his work. See what a wonderful amount of muscular co-ordination is required to turn the hands, both hands guiding the tool, in such diverse positions. Perhaps we can make the leaf quite readily and easily on the right side, while it is very difficult to make it on the left side. Perhaps we find the lowest leaflet quite easy to make, then we find it quite difficult to make the upper ones, with the same movements reversed. We must, however, resist the tendency of the pupils to turn the tile around, thus making all the leaflets in the same way, and allowing the hands to make only those few movements which they find easy to acquire. Remember, this work is educational, and the object of this lesson is to enable the hands to make the physical co-ordinations all over the complex surface in the different directions. When your hands can move readily with ease all over these four leaflets without awkwardness, it indicates a great amount of manual dexterity.

Do not mind the form being rough in the beginning. Make the edges sharp and clean, let the tile be smooth and flat. Make a good broad edge on the leaf. Do not hesitate to make the touches all over the leaf many times. Do not expect it to be finely finished with a few touches. The touches must be repeated. Do not finish up one leaflet at a time, making it very fine and smooth all over. Roughly finish the whole series, and then go over them again. Avoid finicky, small, feeble touches. Avoid picking the clay and making small pieces. Model or mold it into shape with a few free touches. In modeling a form of this kind, if clay has to be removed from the tool, we do not pick it off and place it in the main lump every time, but add it rather to a piece which we keep in the hand. When we need to add more clay, or have to remove it from the model, it can be taken from or added to the lump in the hand. The last step is to trim and square the tile.

Position of Tools.—I have purposely made a number of pictures to show the different positions of holding the tool in modeling and carving. There is no one special hold. The tool is changing from one hand to the other constantly. Experience will give the natural hold. Of course it is

difficult to get the movement from the pictures and the print alone. Seeing it done by an expert is the best way. In teaching, the teacher should go from seat to seat illustrating movement on each tile or slab, if necessary making one leaflet or part of one leaflet occasionally, the pupil looking on and learning.

The Leaf Units.—For the three-pointed leaf form (Illus. 291), make a tile, on the tile draw the leaf with the point of the tool, making the ribs first and then the double curves forming the outline. Practice this a number of times. Make the leaf to fit the tile. Encourage children as much as possible to make these quick drawings on the clay, for position, before beginning to model. Next take a piece of clay, and working with both hands, make the leaf form about three-eighths of an inch thick in relief. Make the stem also. Get the entire shape in the rough, with the fingers, in the beginning. Be sure that the clay for the leaf is thoroughly incorporated with the main mass, and that each piece you add is also incorporated with the adjoining surface. See to this in all cases, so that the model will not come apart in drying.

Illustration 291

A Leaf Tile

Properly worked together this way, the clay tiles and models should be durable, quite strong and lasting. Unless they are struck or allowed to drop, they can be kept any length of time. It is good to have shelves in the class room on which to place these forms. In most of my schools all the walls are completely covered with the work of the pupils. We do this so that they can get ideas from the work exhibited, and at intervals we allow them to take their productions home and place others in their stead.

Next take the tool and roughly make the depressions on the leaf, first for the midrib and then for the side ribs. Let these touches be bold and free. Then model from the center towards the edge, making the undulations on the leaf. Next make the double curves on each side, beginning with the middle leaflet. Do not finish one part,—work all over the leaf. In shaping the leaflet on one side, do not completely finish it, but make almost

every other touch on the opposite side. In this way you will find that you gradually model balance.

It will help a beginner to look at the pictures of some of the modeled leaves in this book, to see how the texture is produced and also how the carved leaves are made. Do not put in very fine detail in the beginning. In making the serrations on the leaf, model each leaflet separately, first on one side and then on the other. Hold the tool in both hands in doing most of this work. Very rarely is the tool held by one hand alone, it is nearly always guided by the other hand. The same is true of the chisel in carving. This form can be varied, a five-pointed leaf can be made in the same way and quite a number of other shapes can be based on it.

Illustration 292

The Moresque Unit

The Moresque Form is quite difficult, although it looks so simple in outline. In making this, first spend some time in drawing it. It is a little difficult to make this form fit the tile. Do not make it too small, let it be about the proportion of Illus. 292. Take a piece of clay, fill in the surface of the form piece by piece with the fingers until it is about three-eighths of an inch in hight. Allow the form to be a little larger than the one you intend to make. Try to keep the double curve on the large blade showing clearly, letting it taper to a fine point. With very little practice you will find that you can get good forms with the fingers alone. With the fingers the clay can be thoroughly incorporated and made into a solid piece. Now take the tool, and, beginning with the stem, make a single plane from one end to the other with a sweeping touch. I want you to draw this double curve repeatedly on the soft clay, compressing and flattening it at the same time. Repetition will in time compel accuracy, until the hand is able to make these swinging lines quite automatically.

Next we will make the other plane, allowing the modeled line to show a beautiful double curve, the modeled line being the raised edge in the middle of the form. Swing over this curve a number of times, then try the curve on the inside or short blade, swinging around from one end to the other repeatedly. Next on the outside edge. As soon as these planes are satis-

factory, then with a single touch cut out the form, beginning with the large double curve, then making the other side of the blade, and lastly the short curve. This is one of the most difficult forms to get properly and still one of the most satisfactory to make when practice gives facility. The entire form should be made with a few strokes when dexterity has been acquired. Do not make finicky touches. Allow the tool to swing from one end of the unit to the other each time, holding it in both hands and pushing away the surplus clay or adding on, as is needed, from a piece in the hand. Feel the form with the tool and draw it out. Next clean up the background and see that the stem is narrow. Much attention must be given to the raised edge, the modeled line; for although when the model is flat on the table this does not show very plainly, it is the most important line on the model, and when it is in position standing up, it shows more distinctly than any other.

The Scroll and Crocket.—Make the drawing of the complete scroll first (Illus. 293), allow it to fill the tile, and then add the crockets, one to each corner. Make this form repeatedly till it fits the tile. At first it will be a little too small and seem a little crowded. Give five or ten minutes to the drawing. Then take a piece of clay, roll it out about the size of the little finger and place on the drawing, incorporating the clay piece by piece till the entire scroll is covered about three-eighths of an inch thick. Make the form a little thicker than it is intended to be. Now add on the crockets, forming the curve and the tip with the fingers. Let every member of the class block in the entire form with the fingers before using the tool. Then take the tool and place the plane or curves on the surface from the tip of the crocket, gradually merging them with the curves of the scroll. Notice that finally the concave curve of the crocket must meet the convex outer curve of the scroll; and the convex curve of the crocket, the concave line of the scroll. Pass the tool repeatedly up and down till a nice curve is made all around the scroll, curving out each tip at the right place, pushing away the surplus clay with the tool, and adding it

Illustration 293

Scroll and Crocket

to the main lump in the hand. The curve around the center boss is difficult to produce in the beginning, but with practice it can be done with a few touches. Then make the curve inside the scroll. This can be very much curved or almost flat. At first it would be better to make it a little flat. Try to swing this from one end to the other with as few touches and with a movement as continuous as possible.

Next cut out the form down to the tile with the tip of the tool, drawing the shape of the form repeatedly and removing the surplus clay. The pupil must be very attentive in doing this work, otherwise the scroll can be spoiled very quickly. The crockets make the form much harder to model, owing to the curve being interrupted, but with a little practice crockets can

Illustrations 294-296

Plaster Models for Drawing, Modeling and Carving

be thrown out in any direction without any trouble. Later on the double-curving crocket and other forms can be introduced on the scroll in the same way.

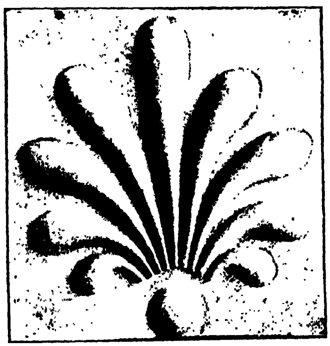
Combination of Scrolls and Leaflets.—To make two scrolls in clay flowing one from the other, is good practice. A leaf tip can be modeled coming out of the center. To make this form fit the tile, and to curve the scrolls gradually, one from the other, with single sweeps of the tool, is capital manual training. Combinations of different forms can then be attempted, and balanced designs made for various purposes.

The Anthemion is perhaps the most difficult of all the elementary forms and takes the most time in the beginning. (Illus. 298.) Make a full-sized tile. Make the drawing a number of times first, endeavoring to get the form to fit it. Roll out the lobes in the hand, beginning with the center lobe. Numerous lobes can be made as illustrated in Book Two, Chapter IV. Be sure that they taper to a fine point, and as they grow slim towards the base let them also grow less high in relief. Bend the side lobes so that they curve and balance nicely. Make the lobes match. This is a little difficult at first. Try to get a good curve to each one; show the gradation in the form. Try to feel with the fingers the magnitude of each lobe.

Begin tooling with the center lobe, push away the surplus clay, and make it taper to a fine point. It is difficult to prevent the stems or pipes of the lobes from running into one another. Beginners cannot help this at first. To keep all these stems gradually curving in to the center and to get them to diminish gradually requires a great deal of skill. Do not expect fine results in the beginning. Hold the tool firmly with both hands

Illustrations 297-298

Scroll and Leaflet



Anthemion in Clay

and model each lobe from side to side. The widest part of the lobe will be the thickest. The form must be blocked out roughly in the beginning with a few large touches to get the approximate bulk, and then it must be modeled over again several times, each time getting a finer finish.

Do not expect good results the first time.* Any one making this form can realize what excellent discipline it gives in attaining dexterity and physical co-ordinations. Do not allow the children to turn the tile, keep it in one position throughout the entire lesson. Of course if I were to move it from one side to the other and to keep my hands in the same position all the time in making each lobe, it would be much easier to model. But remember, the object of the lesson is to get the skill that is given to the hands when they become able to move with facility all over the complex form. Pay particular attention to the stems, clean the spaces between the lobes, cut the tile true. This form is much used in carving, modeling, and drawing, and it is one of the best of all the units of design for its union of beauty, balance, proportion, grace, etc.

Illustrations 299-301.

Various Arrangements of the Anthemion

The Curved Leaf.—(Illus. 302.) First, make this fit the tile. Make the drawing a number of times. Do not make it too small; allow it to fill the tile. Block in the form with the fingers, as described in making the other forms; be sure to keep the effect of the double curves. Allow the leaf to be nearly half an inch thick in the thickest part, while the back of the leaf tapers down to the tile. Model a large double curve on the back of the leaf first with the tool. Try to make the surface undulate. Keep the double curves of each leaflet true and try to make them with a single touch

*"The repetition of good action generates the habit of doing well, function developing construction, and the habit of doing well generates a moral feeling in regard to said action, which it becomes at last a pain to go against."

of the tool. The spaces between the leaflets should also be made with a single touch of the tool. Get the texture on the surface of the leaflet representing the small ribs, then finish with a narrow stem. To make this leaf with graceful curves, so that it appears to swing nicely, requires practice. Try to prevent a thick and clumsy appearance of the leaf. The tool marks will give very good texture to leaf form. This can be made much more complex, showing more leaflets.

Simple Shell Forms.—The real scalloped shell (page 235) can be conventionalized as desired. Make the drawing, get about the proportion and size, and then add on the clay, making the shell curve up, being sure that it is incorporated on the tile. Repeatedly speak of this to your pupils. It is very uncomfortable to find a shell form like this, for instance, come off the tile, when it dries, especially if a lot of careful work has been placed upon it. Try to get the halves of the shell to balance with the thumbs and forefingers, working at both sides at once. The thumbs are very useful in this work. With a little practice one can make an entire shell form with the fingers and thumbs alone; of course, roughly.

Practice this movement continually. Feel the balance of things. Then you will be able to draw balance. Sculptors often find the thumbs their best tools. We must use the fingers as much as possible, but do not expect to make the sharp edges, the fine detail expected in woodwork, metal work, stone work, and so on, with the thumbs alone. The tool must be used for this. As a person becomes more skilled he will find the fingers more useful, and in making the human figure sometimes the thumbs and parts of the fingers are the main tools used. (See Plate Eighteen, page 235.) Use the tool to make the ribs on the shell. It is very difficult to make these taper. The shell is a wonderful piece of architecture. There are no finer lines or curves in nature than may be found on a good-shaped shell. Try to make the lines all converge and taper gradually. Model on each side. Do not finish one side first and then the other. It is much easier to model both sides, to make all the ribs

Illustration 302

The Carved Leaf

Illustrations 303-304

Real Shells for Models

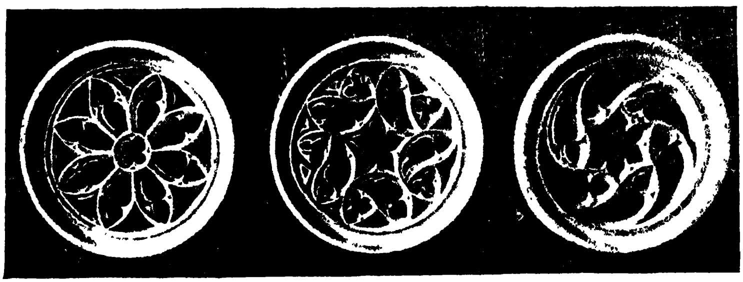
All kinds of shells are suitable to be reproduced in clay. They are cheaply purchased if not otherwise available, and offer endless variety in form, proportion, etc. The accompanying text describes the shell work illustrated on page 235, not the making of these shells in Illustration 303.

and serrations first, in the rough, and then to shape them up and make them still finer. The lines of growth as well as the lines of texture show on a real shell. If you are copying from a real shell endeavor to get these. In some conventional shells and models of shells the lines of growth are left out. The suggestion of a spiral in most shell forms where the lines meet together is very beautiful. Try to make a true spiral instead of a bent line. The last part to model will be the serrations on the edge of the shell. Cut these out with a few simple touches.

It must be constantly remembered that, at best, word descriptions of how to model are inadequate, compared to the actual doing. The reader who will try modeling, who begins with the elementary work and follows

along into the more difficult forms, will quickly realize the merit of each point advanced in these pages. Experience is the best teacher.

The student will find many suitable forms for modeling suggested in the drawings in Book Two, and the carvings in Book Four. Many of the plaster casts contain also suitable forms.. After making a few of the simple units, designs should be made, consisting of some of the units combined in different ways, as illustrated in the picture of tiles on page 231, and on page 189 in first part of book.



Gothic Rosettes Models

PLATE NINETEEN

Modeling a Lion

This pupil is modeling Lion and Snake, by Barye, from a cast. It is enlarged one-third. The clay model will be fired at a pottery and turns out a fine color. A good terra cotta model of one of the Barye animals is a fine work of art. The clay is fired very hard and is partly vitrified, making a very durable piece of work, showing every tool mark.

Advanced Clay Modeling

These boys are making large original designs and animal forms in clay for architectural purposes. Advanced class, R. C. High School.

CHAPTER VI

Modeling Animal Forms

ANIMAL FORMS.—After the children have modeled several comparatively elaborate tiles and can produce simple forms with good balance, proportion and fitness, they should be allowed to model some of the various animal forms illustrated. Small heads are suitable to begin with. Allow them to make their choice of the sheep, dog, tiger, horse, lion, or other animal. The teacher will find by experience that pupils work with a great deal more energy if they are allowed to work on some form that pleases them. The series of head forms illustrated in 306 has been made for this express purpose. Some of them are quite difficult and some comparatively simple, but if a boy like a horse's head better than a dog's head, although it is much harder to model than the dog's head, he will succeed better with it. So it is with girls. The girls will sometimes select the tiger's head, in preference to the sheep's or the dog's head, although it is much more difficult.

Do not, however, let them attempt the very complex forms till they have made several of these heads. Let each pupil have a separate model, and never allow two or three pupils to copy from one model, if they are seated at tables. The pupils must be able to handle the form all over, whenever desired, or to put it in any position desired, to compare it with their own work. This cannot be done if two or more are working from the same model. Build up the form in the rough first, being sure that the clay is thoroughly incorporated, that it is a solid, well-wedged piece. Do not allow cavities

Illustration 306

Casts of Animal Forms

This set was specially modeled for school purposes, and then duplicated by making plaster casts therefrom. There are about twelve heads in the set; some are pictured on page 181. They form a fine series of models for various classes. For further remarks on these and other plaster models of various forms, see pages 180-184.

to form in the clay. If there are many air spaces in the lump, it is apt to crack in firing, or even in the drying when it is put on the shelf before firing.

I earnestly desire every one reading this book who wishes to get suggestions on the work of modeling, to examine carefully the pictures given of the class rooms. Notice the variety of models around the walls and on

the shelves. All of these pieces of work, except the very white ones, which are plaster casts, have been modeled by the pupils. By studying these plates carefully, ideas can be received as to the best way to work.

Do not allow the pupils to make details in the beginning. Blocking out means to be able to get the large shape roughly first without any detail. This is one of the most difficult things for beginners to do. Nearly always they will begin to make the features before the size of the head is gained. Also try to prevent exaggeration of size. Beginners, especially in making heads, will almost invariably enlarge the size. It takes time to overcome this disposition. If the illustrations accompanying this chapter are carefully studied, you will find by looking at some of the pupils working, that they have produced first the general form in the clay, and on this the careful working for detail is done.

Very little can be said in print on this subject. The model is the best teacher. Till the form is like the model, the pupil can go on working, changing and altering. Allow the pupils to measure if it helps them in the beginning. Rough dimensions can be formed by means of the tool. Usually the plaster models are much smoother than the forms from which they are produced. The plaster casts have been made by pouring the liquid plaster into molds. This, of course, leaves the smooth surface usually seen on plaster casts. The pupils very soon notice the texture of different substances, the texture of wood when it is carved, the texture of metal, the texture of original models in clay. They soon find that it is not always necessary to make the smooth surface of the plaster cast. The required surface varies with the different forms. There is no one kind of modeled surface. On the head forms the tool marks can show, as they do in some of the illustrations. It is far better to show the tool marks all over than to make the form so smooth that it looks like a piece of jelly or pudding. Any good modeler or sculptor will give advice about his work at any time to a student who is unable to work in a school.

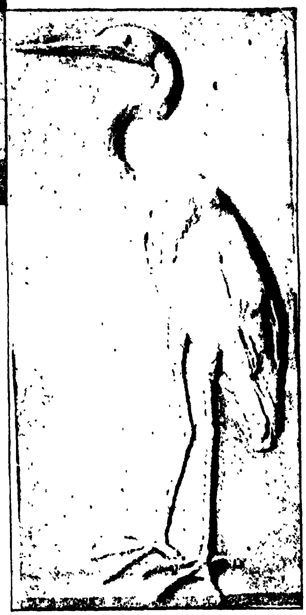
For variety, after one or two heads have been made, the pupils can attempt the Barye casts (page 213). These are used in all my schools. They are perhaps the most perfect examples of beautifully modeled animal forms that can be procured. There is a great variety, and all of them seem to interest the children, many pupils being able to duplicate even the most elaborate of them.

Illustration 307

The Real Bird

Modeling from Birds

The panel below is a model in clay from the real bird shown at the left. The panel was made by a pupil of the grammar grade, who had had more training than the pupil that modeled the bird illustrated on page 207, and we therefore have here a better product. This panel is about 16 inches long. The pupil has had only two hours a week in the Public Industrial Art School for drawing, modeling and carving. It must be constantly remembered that these three branches of work are taken in rotation by all pupils. Excellent as is the training afforded by modeling in clay, this training is still better when combined with appropriate exercises in drawing, designing, carving and wood construction.



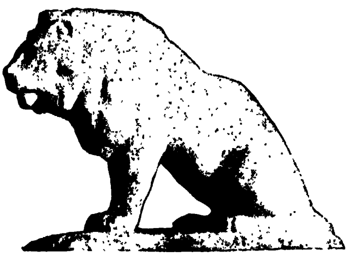
The Model in Clay

The Animal Forms.—The pedestal or plinth is usually made first, and then a rough form about the size of the body is put in the required position by a very solid prop under the abdomen. Let this prop be thick and substantial. It does not matter if it fills the whole space under the body, in the beginning. The first day the form can only be very roughly built up, making a kind of core. After the second day, this clay will be found to be much more solid. It shrinks an hardens so that about the second or third day it is quite substantia

and clay can readily be modeled onto this core, making the form the required size and putting the legs in the required position. Every day the clay will shrink. If a model is to be made of the same size as the original from which it is copied, it must be started a little larger. The shrinkage is about one inch in eight. Remember, the clay shrinks while the form is being made till it is quite dry, and then it shrinks again when it is fired at the pottery and turned into stone. See Plate Thirteen, on page 186.

Do not let the core dry too much. It must be only a little harder than the clay that is added to it. If it is too hard, the clay will shrink unevenly and cracks will result. If the core, or the form in the rough, is moistened too much when it is put away, it is apt to fall down. Nothing but experience will teach the proper manipulation. Of the two states, it is better to keep the clay a little too hard than too soft. As the model approaches completion, it should be allowed to become harder, and the props or supports under the body can be gradually cut away. It is a little difficult to get a large model to shrink evenly all over, but after two or three attempts on forms that are not too difficult, like the animals that are sitting on their hind quarters, it will be found quite easy to model the more complex forms that have a number of supports. If the props are cut away too soon, and before the clay is stiff enough to support its weight, disaster will

Illustrations 308-309



Modeled by Grammar Grade Pupils

result. The remedy, if the forms fall down, is to build them up again with new props, being sure that the broken surfaces have been made wet, so that they will stick together. This frequently happens even to good workers.

For all of the small forms illustrated in our ordinary class work, it is better that the pupils should make their models without any interior supports, that is, without pieces of wood, or of lead pipe, or of iron and wire. We prefer to omit these so that the clay models can be fired at the pottery and the child can keep his original work,—his model when fired showing every tool mark and being very durable and strong. This is much better than to have a cast of the model made, which is done in a great many schools. In our art school over 900 pupils model each winter, and it would be very expensive to cast all their models. The children get a great deal more skill in being able to build up their forms with such solidity. It requires more skill to keep the clay of a regular consistency, so that it will shrink evenly without falling down. Of course, if a plaster cast only is desired, supports can be used inside, or lead pipe can be bent into the required shape. This makes it more easy to model the forms. A plaster cast, however, breaks very readily, chips easily, and, if handled very often, looks quite dirty in a short time. I recommend for school purposes keeping and firing the original models.

Many choice forms suitable for modeling can be found in the pictures of the carving department. All the conventional forms of the different styles make suitable subjects for modeling.

Before dolphins, griffins, grotesques and other complex forms are carved, they should be modeled.

Modeling Natural Forms.—It is only possible in a book of this character to give suggestions for work on a few subjects. As many natural forms as possible should be studied. When I speak fully and at length about shells or fish, it must not be understood that I mean only those forms. Birds, crabs, and animals of various kinds should be studied in the same way. My idea is simply to suggest suitable forms and ways.

Each year we find it feasible to try new subjects before thought not attainable in the school rooms. Shells and fish, butterflies and birds, have been seldom used by large numbers, as they are now used for some of our classes. I find them durable and lasting to a remarkable degree. Stuffed birds in the studio, that have been roughly handled for 18 years by private pupils, are still fit for use. The colors especially seem to be quite permanent.

The fish forms illustrated in Book Two, beginning on page 143, are all used for models in the art schools, with many others. They are mounted on

panels of wood and are very durable. They are used in the modeling room as much as in the drawing room.

Modeling the fish in clay seems to make a very enduring impression upon the mind. The children are really fascinated, for the time being, with

Illustration 310

Modeling Fish Forms

Real mounted fish are used as models. Birds, fish, butterflies, shells, etc., are also kept for general use in the drawing, modeling and carving rooms, as well as casts of various art and nature forms. Conventional forms are also made, embodying fish forms, such as dolphins, grotesques, etc.

the strange and sometimes beautiful forms and colors. The *inspiration* is in the natural forms, as it should be, and the mere contemplation of the forms seems to influence the pupils to action. It is inspiring to the true teacher to

realize the moving force and power of nature. Bring something into the class room like a new bird form, or fish form, and all of the children follow it with their eyes, which seem to almost stick out; there is no lack of attention here, the magnetic influence is at work, the divine energy is flowing. We should flow with it instead of trying to thwart it, as is too often done. This magnetic and energizing power of nature has a splendid influence on the physical, mental and moral development of the young. It also fills the children with interest, imbues them with vigor, inspires them to think and work, while at the same time giving them an appreciation of beauty that adds vastly to the ability of the young to enjoy life.* These are certainly most desirable attributes to develop in youth, for whatever one's vocation may be, the individual should be the better for this training. It is thus distinctly practical, and commends itself to the most materially inclined, as well as satisfying the more ethical aspirations of our nature. "The emotion accompanying every generous act adds an atom to the fabric of the ideal man." By working direct from beautiful natural forms we unite the emotion with the action, and thus still more thoroughly educate.

The tile is first made, as in Illus. 310, and then the fish is built up piece by piece, taking care to keep about the general proportion. Then the tool is used to get the surface and fine curves. When the bulk of the body is about right in proportion, then the spines, fins, eyes, etc., can be added and the details made upon them, the scales usually being the last thing represented. Fish can be readily cast in plaster, and are very easy forms to begin

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*"Beauty is not a luxury, as some seem to believe. It is not the exclusive privilege of the few but the common heritage of the many. The rich cannot monopolize it, and persons of taste cannot appropriate it to themselves. There is in every human breast a sense of responsiveness to the beauty of the external world, and the difference is only in the degree to which that sense is developed and cultivated. It is confined to no class, to no age, to no stage of civilization. It is an universal hunger, and its cravings demand satisfaction as urgently in the cabin as on the throne.

"And yet this sense of beauty is too often repressed and crushed instead of being nourished and educated as it deserves. Much happiness is thus lost out of life, for the sense of beauty, wisely administered to, is a wellspring of pleasure. It is even more than this. It is a fountain of life itself. It adds to its fullness and energy, its refinement and delicacy, its sweetness and purity. The life from which it is ungraciously pushed out grows inevitably harder and rougher, coarser and colder, and its influence over other minds deterioriates in the same way.

"How shall this sense of beauty be saved and educated, for rich and poor, for old and young? One way is by contact with its presence. Another and still surer means of cultivating the sense of beauty among us is to accustom ourselves to create it in daily life. This is a part of education and of self-culture that is sadly neglected.

"Then there is the beauty of truth and of character. Perhaps we dwell too much upon the dry and stern aspect of duty and forget to exhibit or to admire the beauty of goodness. But as fast as duty, instead of a sacrifice, becomes a desire, and the love of righteousness becomes the ruling motive, does the character become noble, admirable and beautiful. So all beauty is bound together and leads up from the smallest things of life to the greatest; from the most material to the most spiritual; from the simplest and humblest to the most exalted."—[Anonymous.

upon in doing plaster casting. The forms are comparatively simple and can be removed from the mold without difficulty.

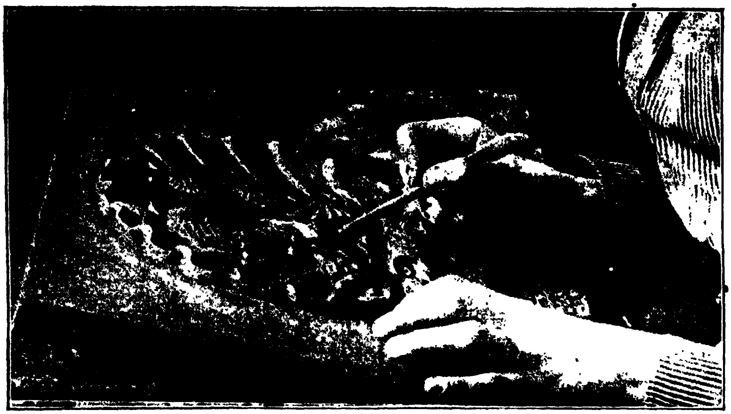
This work of modeling looks simple, and it is easy when you know how. That is to be learned by actually modeling, rather than by reading about it. The suggestions given in these pages will help, but you must do the work to realize its educational power. The more you model, the more facility and accuracy you will obtain, and the more you will be fascinated with this mode of thought expression.

Griffin, Original Design.

Modeled by a R. C. high school boy, for architectural use.

PLATE TWENTY

These designs have been cast in plaster from models made in wax by the pupils of the Public School of Industrial Art (grammar grade). The panel on the left, darker in color than the rest, represents a wax model partly finished.



Original Design Modeled in Wax
The design is afterwards cast in plaster and the wax used again.

CHAPTER VII

Wax Modeling

THE DESIGNS SHOWN IN THE PLATE on the opposite page are modeled in wax, and were made by grammar grade pupils. They are either their original patterns or heads, antique forms and bird forms which they have copied. For convenience, boards 8x14 inches are used to model on, as illustrated above. The pupil first makes a drawing or sketch in chalk on the board. When this is satisfactory it is then lined in with the pencil.

The wax is much stiffer than ordinary clay. It is sometimes also quite sticky and not so pleasant to use as clay. We use it simply because it can be kept an indefinite time, and very fine complex pieces of work requiring a long period of time can be kept from month to month on shelves without their having to be moistened, as is the case with clay. Unless the clay models are wet at frequent intervals they dry up and crack and are of course spoiled. With the wax a piece of work can be labored upon for months if necessary. Real modeling wax is worth about $1 a pound, the best kind. There are several very good substitutes, however, on the market under several names, which are quite as good for general use. Composition clay is used frequently, costing about 30 cents a pound. The

same tools are used as in clay modeling, and if the wax is a little sticky it is advisable to have a cup of water to moisten the tools and fingers occasionally.

Wood of a little roughness in texture is the best to model upon. Wax must be rubbed into the surface so that it will stick firmly. On this surface the form can be built up into the desired shape, planing off with the tool and forming it as described in the clay modeling. Wax is used for modeling very fine forms to be cast in metal and other materials. Medals and coins are usually modeled in wax. Very fine and beautiful work can be made with small tools. A common slate with a wooden rim is a useful surface to model upon.

Illustration 313

Original Panel in Wax

The form is modeled in an upright position by being clamped to a board. The same form with different lighting is shown opposite. By viewing the model with the light and shade changed it can be improved. It is important to get good light and shade.

It is advisable to allow some of the advanced pupils in each class at intervals to work in wax. For general purposes, however, it is not so good as clay. Do not allow pupils to make very fine work all the time. Let them occasionally make a large, bold piece for contrast. Wax can be purchased in a number of colors,—bronze-green, brown, red, gray. For general purposes gray is best. Bronze-green is very suitable for figure work, having somewhat the appearance of a bronze when finished.

Wax or composition clay is also more portable than common clay and has been used with success in several of my summer schools. Models of animals, figures, designs, can be boxed and carried with safety when modeled in wax, when a clay model would be broken. The clay when dry is very brittle, and any sudden jar or shock will break large and heavy work unless

it is fired. For this reason wax is a good substitute. When the wax has been used many times and becomes discolored or dirty, it may be cleaned by melting it.

The plate or designs made by grammar grade children, page 256, has been taken from casts made from the wax models and then the wax is used

Illustration 314

Modeling a Dolphin in Wax

The form can be rapidly chnaged and improved when viewed in a different light. Use the fingers and thumb as a tool, as illustrated in the above picture, as much as possible. Fine curves and swinging lines can be made this way.

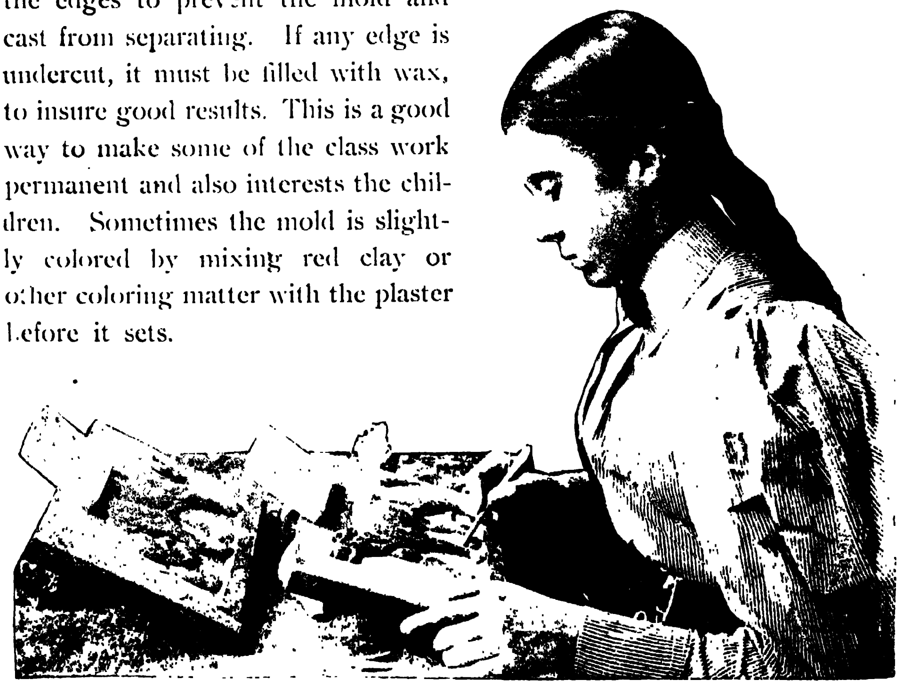
over again many times. Simple designs of this character can be readily cast by the pupils or teacher in the following manner :

When the wax pattern is finished, build a wall of clay around the edge of the design about one inch high. This wall, or fence, of clay, must entirely inclose the design with desired margin. Next take a tin vessel and put in enough water to more than fill the inclosed space. In this water sprinkle the dry plaster with a large iron spoon, stirring it slowly until about the consistency of thin cream. When in this state, pour over the wax model, taking

care to see that the liquid fills all the pattern and space without any large bubbles; this will soon set and harden, and should be about one inch thick. The clay rim can then be removed, the plaster tile lifted from the board, and it will be found to retain the form of the wax model. When the plaster mold is hard, the wax can be pulled out, leaving the exact shape of the model reversed in the plaster. This is the mold.

From this mold another cast may be made that will repeat the form of the wax model. To do this, a clay wall must be built around the mold, and the surface and all parts of the impression upon it must be brushed with sweet oil; this prevents the new plaster, when poured in, from sticking to the mold. The liquid plaster can now be poured in. When it is hard the cast can be separated from the mold by tapping it gently or inserting a blunt knife as a lever. If successfully done, the cast should be a complete copy of the wax model.

Of course this can only be done with flat forms that do not project on the edges to prevent the mold and cast from separating. If any edge is undercut, it must be filled with wax, to insure good results. This is a good way to make some of the class work permanent and also interests the children. Sometimes the mold is slightly colored by mixing red clay or other coloring matter with the plaster before it sets.



Enlarging Animal Forms

These low relief forms are modeled in wax from small casts.

BOOK FOUR

Wood Carving

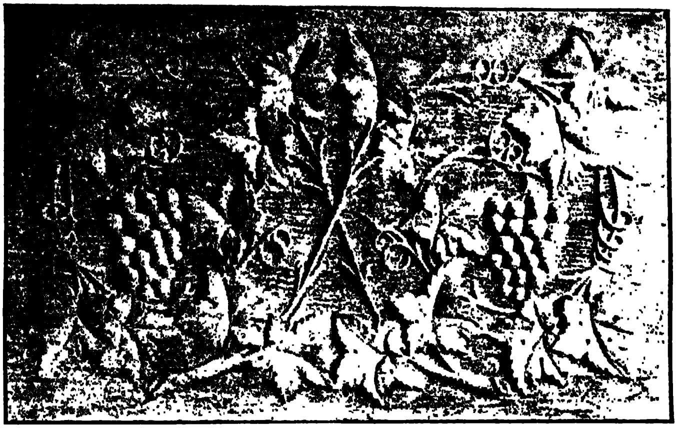
"The hand, destined to become the instrument for perfecting the other senses, and for developing the endowments of the mind itself, is, in the infant, absolutely powerless."—["The Hand," Sir Charles Bell, K. G. H., F. R. S.

"Awkwardness of limb and inability to use the fingers deftly, continually entail small disasters and occasionally great ones; while expertness frequently comes in aid of welfare, either of self or others. One who has been well practiced in the use of his senses and his muscles, is less likely than the unpracticed to meet with accidents; and when accidents occur, is sure to be more efficient in rectifying mischiefs. Were it not that the obvious truth is ignored, it would be absurd to point out that, since limbs and senses exist to the end of adjusting the actions to surrounding objects and movements, it is the business of everyone to gain skill in the performance of such actions."—[Spencer, Principles of Ethics, page 515.

PLATE TWENTY-ONE

Partial View of Wood Carving Room, Public School of Industrial Art, Philadelphia

The pupils, whether of the grammar grades or teachers' classes, rotate into this room from their work in drawing, designing and modeling. By this means, one comparatively small room suffices for 800 pupils in rotation at different hours, 40 working at a time. This picture also emphasizes the simplicity and cheapness of equipment.



Designed and Carved by High School Pupil

CHAPTER I

Tools for Wood Carving
Design in Wood *

WOOD CARVING is one of the most beautiful of arts. It requires a real knowledge of form, therefore its educational value lies in enabling pupils to receive fixed or permanent impressions. Just as pupils acquire dexterity and skill in drawing on blackboard or paper, and just as they gain similar dexterity and skill in soft clay, so I wish them also to obtain dexterity in tough wood.

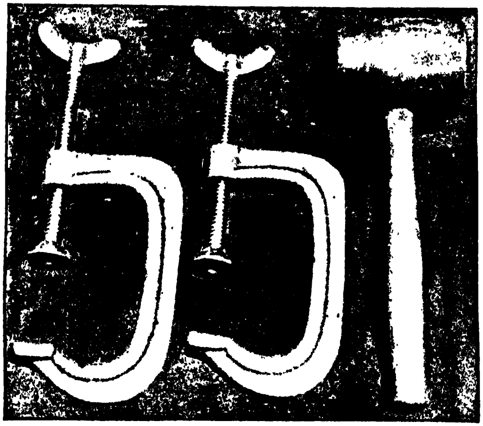
The tools required in carving are very simple. A few gouges and chisels and a mallet, with clamps to hold the work on the table or bench, will be enough. In wood carving, as in carving in marble or other stone, few tools are needed; the fewer the tools used, the better the workman. A

*The carvings and similar work illustrated in this chapter are all done by the children of the various grades.

mallet and a few chisels are the only tools used in sculptured work, and as far back as we can trace in history the tools appear to have been similar in shape. On the back of the Venus of Milo rough tool marks may be seen that indicate to us the kind of edge and size of chisel used in that period of the greatest Greek art.

The Tools.—In carving, the simpler the chisels and the fewer in number that are used the better the result. Some carvers have rows of 50, 60 or 70 different chisels, but these are usually not very good carvers. Again some of the finest carvers will do all their work in wood, even the most intricate and most elaborate sculpture work, with perhaps no more than half a dozen. My sets for ordinary school purposes usually consist of about 10 tools. It is far better to become thoroughly familiar with all the capacities of a few tools than to handle a great variety.

Illustration 316



Clamps and Mallet for Wood Carving

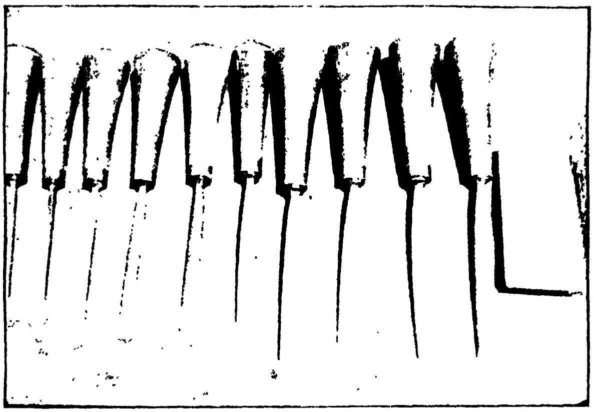
Age at Which to Learn.—As soon as children are big enough to swing their elbows freely above the table or bench, they are ready for carving. Carving is work; not hard work, but work that compels the exercise of a certain amount of energy. Some women are deterred from carving because they think it is hard, and requires the exercise of main strength continually. This is not so. Like marble carving, wood carving is re-enforced by the use of the mallet. If the chisel or gouge cannot be readily pushed through the wood, the mallet is used, and any one who has strength enough to drive a tack can cut the hardest wood. Children of eight or nine, therefore, unless they are constitutionally defective or very weak, are quite large enough and strong enough to carve, and usually enter into it with a great deal of energy and joy. It is fun to them to see the chips fly, and they find it especially attractive when they discover that from the beginning they can make fit and beautiful forms,—rather than the amateurish

things used in some schools, where the children spend their energies on feeble imitative constructions in wood.

Just as our children from the beginning are fit to draw forms of the best style, embodying beauty and grace; and just as in modeling they can make fine forms of the best periods, so in wood we find it to be of advantage that they should from the beginning do the best class of work possible, and become familiar with the forms best suited for this material. It does not follow that because a mind is young, it is less bright and clear in perceiving beautiful and true things. It is just as wrong to give children feeble, aimless forms to model and carve because they are young, as it is to utter baby talk to them when we wish them to speak clearly and to enunciate properly.

The Wood to Use.—Do not let the pupils use soft wood at first,—such as pine or poplar. This advice, it is true, is opposed to the

Illustration 317



Set of Carving Tools

Including small sharpening stone. With this simple and inexpensive set of tools all ordinary carving can be done.

usual practice in schools. Usually the pupils are allowed to chip blocks of soft pine or poplar. This is a mistake. From the very beginning our pupils, as can be seen by the illustrations, make in hard wood panels fit to be utilized. My reason for using hard wood is that the children from the first

may get accustomed to the texture in ordinary use; most carving being done in oak and mahogany, cherry and walnut, while only occasionally are soft woods employed. The best and the cheapest wood for school purposes is oak. It is a little tough in texture, and offers just enough resistance to prevent it splintering and cutting too freely. If you give a beginner a piece of very soft wood, it splinters so readily that when attacked without skill, the forms are soon spoiled. With a piece of hard wood, on the contrary, a great deal of cutting can be done without splintering the work. Of course it requires more labor, but the product is better,—and there is not so much disappointment. The grain being of firm consistency, it does not give way in unexpected places, as it so often does in the soft wood.

Designing the Form to Carve.—The pupils should from the start make a design that will be of use and value. The first panel can embody the forms that have been given in the modeling. It is not necessary to carve a series of panels, each of which has a separate unit on it. The units may be combined from the beginning, and a panel that will have some value and that can be used for some purpose is the result. In every article printed about carving heretofore, pupils are recommended to practice cutting on soft blocks of wood first, apparently just to get exercise. They are advised to use tracing paper to transfer drawings to the wood; sometimes carbon paper is recommended; at other times tracing cloth, or they are taught to use a pattern wheel,—this is a wheel with little spurs on it that prick the outlines through the pattern into the wood. Some even advise the making of stencils, the forms being cut out in stiff paper in order that the pupil may draw around the edges, and so produce the designs. These are very erroneous bits of advice, and such methods must be avoided by the carver who does not wish to be a feeble amateur.

Let the pupil take a piece of chalk and draw freehand a simple pattern, —say the scroll doubled. Reserve a simple band around the edge of the panel about half or three-quarters of an inch in width. Practice making this drawing till the scrolls balance and fit the space. It is a little difficult to draw freely on rough wood, but with practice it can be done readily. Add a few crockets if desired, each added form making the carving a little more complex. As soon as the form is satisfactorily placed, then with a soft lead pencil—one with a thick lead preferred—make the outline permanent, drawing the line heavily, so that it will not rub off. Any good teacher will

see the absurdity of advising children to trace or to paste on the wood or to produce by artificial means a pattern that ought to be produced automatically by the hand of the pupil. It is because from the very beginning we compel our pupils, on all various surfaces and in the different mediums,

Illustration 318

Positions of Hands in Carving

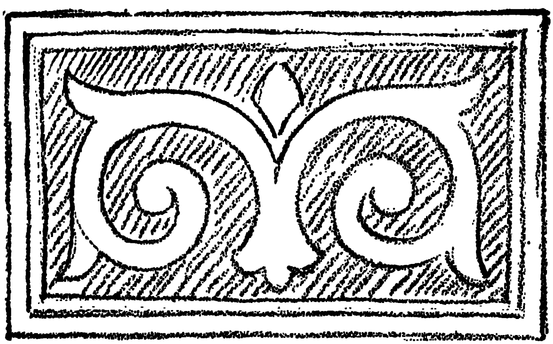
This picture represents four hands gripping tools in various positions. In cutting from right to left the left hand will usually be guiding the tool and also resting on the work to prevent the tool from going too far.

to make the work freehand, that we get the results we do—uniting hand dexterity with originality of product. I have in one school alone 900 pupils carving, and have never had two patterns made exactly alike since the school started. This drawing on the wood, in the beginning with the

chalk and then with the lead pencil, gives very good practice. It requires only a few minutes to do it, and makes the children feel in the beginning that the work is their own. It is very wrong to allow pupils to cheat; and it is really a sort of deception when they are allowed to claim as their own work that which has been copied or traced.

The background can now be scored with the pencil all over. (Illus. 319.) This prevents the pupil from cutting out the ornament instead of the background,—a mistake which will frequently occur unless proper precaution is taken. It is only by repeated experience that pupils begin to grasp the idea of form on flat surface. Very few can see a background all over and distinguish it readily from a pattern on the background, unless they have had practice in making these forms. Even adults will frequently cut out part of a pattern by mistake, and do this several times before they get accustomed to distinguish the difference. It saves trouble, therefore, to score the background in every case with beginners. Then very little work is spoiled.

Illustration 319



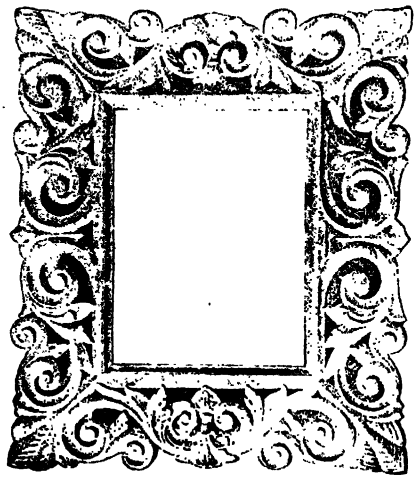
Background Marked Over for Cutting Out

As to Graded Work.—Illustrations are given herewith of graded panels showing the different elements of design separately cut and exhibiting the different stages. These are made simply to illustrate the steps in carving,—a first, a second, and a third stage. They must be carefully studied in advance, and then it will be easier to make the first attempt. In our schools the children see all these operations going on at once, on the different panels. They soon take in the idea, and we find in consequence that it is not essential for each one to make the different units separately, but they can begin on panels.

A number of pictures of panels with graded exercises have also been prepared for those who like to "systematize things." These forms, however, are mainly useful for pupils who have never had any practice in draw-

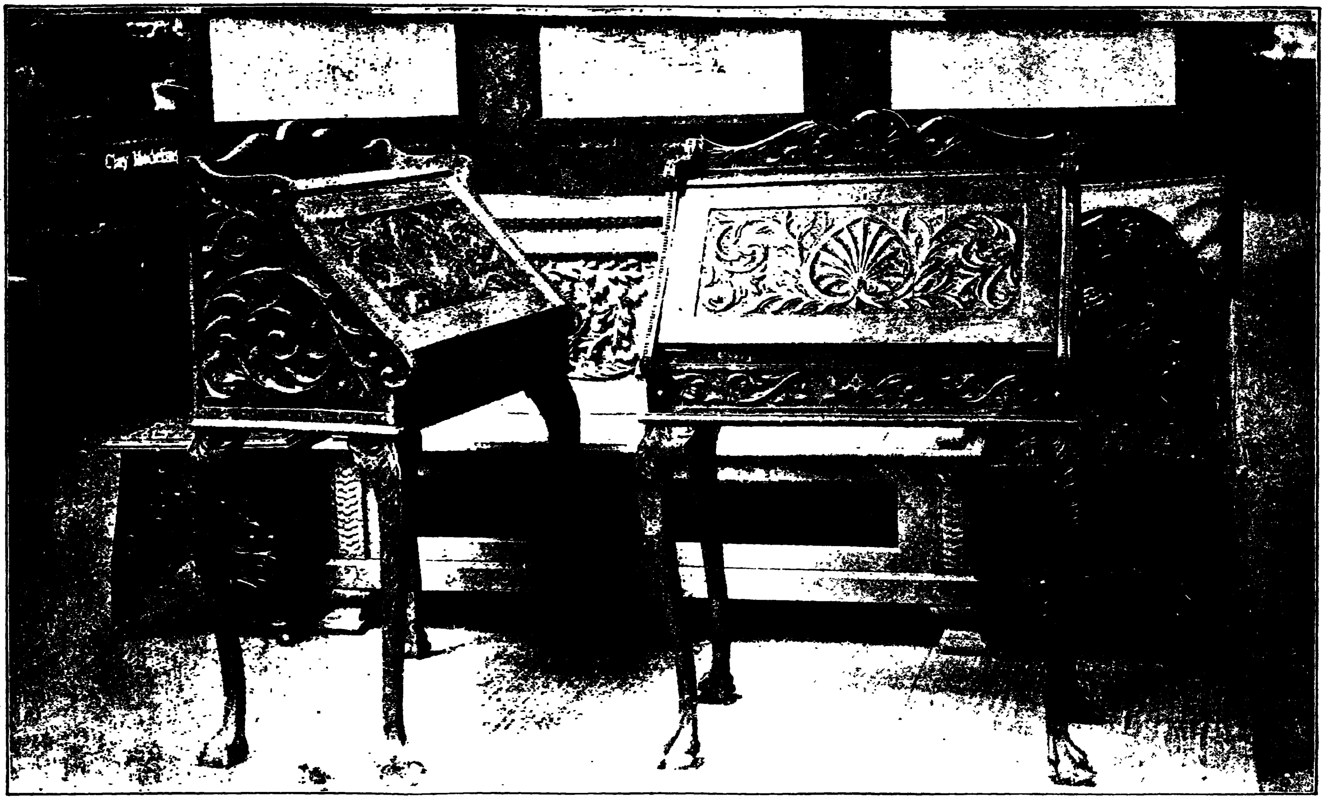
ing and modeling. All the pupils in my schools receive the drawing and the modeling from the beginning, in rotation with wood carving, this rendering it unnecessary for them to make the elementary forms. Usually a pupil who can draw a good scroll, and who has modeled the same, can begin to produce it with the chisel in the first lesson.

Illustration 320



A Picture Frame Designed and Carved by Grammar Grade Pupil

PLATE TWENTY-TWO



Examples of Wood Carving

This illustration is from work exhibited at the Philadelphia Bourse, 1897. The two desks have been carved by grammar grade pupils. The settee and chairs are [illegible] pupils of the Public School of Industrial Art.

Carved by Grammar Grade Pupils

CHAPTER II

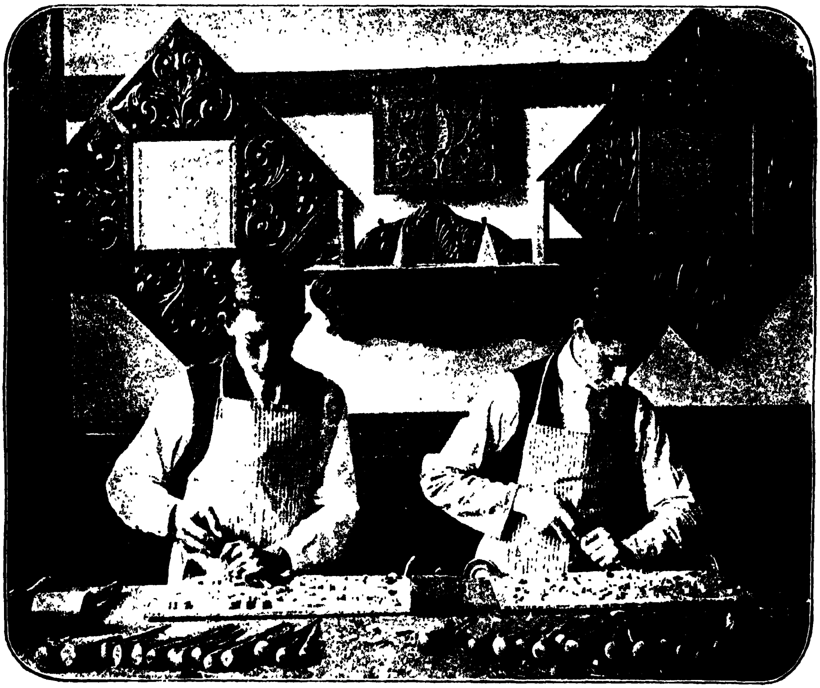
Instructions for Elementary Carving

HOW TO CARVE.—Take a gouge, and without removing the lead-pencil marks from the panel, gouge a channel around the design. Grasp the tool firmly in both hands. There is no one position for holding the chisel (see Illus. Nos 322 to 326), but in doing this work, the chisel should change from one hand to the other, as we work from right to left or the reverse, sometimes one hand guiding the chisel and sometimes the other, but most of the time both hands grasping it tightly and helping to guide it.

Cutting tough oak is splendid discipline. Unless the tool is held firmly, it is likely to slip and cut the wrong place. The wood being easy to cut with the grain and hard to cut against the grain, it is difficult at first to make the chisel sweep around a curve, because some part of it will be hard and resist, while the parts of it that go with the grain will be soft. A very few attempts will enable a pupil to find out this characteristic. It is one of the things that we can properly learn only by experience. All the speech in the world and all the talk of a dozen teachers will not enable one to feel these things. If the tool is not very sharp, or if the wood is a little too hard to be cut with a simple pressure of the hands, one hand can hold the chisel and the other drive it, like a mallet, or the mallet even may be used.

It is better, however, in the beginning, to practice as much as possible by pushing the chisel through the wood, so that both hands can get the power to grip the tool tightly, and at the same time to guide it. Do not be too anxious to remove the wood quickly. Endeavor to make free curves from the beginning. It is perhaps better to make slight grooves at first

Illustration 322



Wood Carving

This picture shows method of clamping work to the bench, position of tools and method of grasping tools with both hands. Various pieces of work carved by the boys are in the background.

and then gradually increase them in depth as one's power increases. It will be found very soon that while one hand guides the tool the other will hold it back as much as possible. These movements must be practiced continually till the wood is entirely removed around the whole pattern. The gouge can then be used to remove roughly the rest of the background.

working the chisel as freely as possible and taking care not to cut too deeply into the wood. About one-quarter or three-eighths of an inch is quite enough. Do not attempt to smooth up the background in the beginning.

Other tools can now be taken and the forms can be cut sharp and clean around the edge. This is done by taking a curve that will fit the edge, and cutting it down vertically with a few taps of the mallet. Endeavor to make a continuous clean cut with the tool, fitting successive tools to the altering curve of the outline. Do not let it show irregular marks. Do not try to make a wide curve with a narrow-curved tool. From four to six curves will fit almost any part of a scroll. Where the curve is acute, a chisel of quite an acute curve must be used; where the curve is almost flat, a flatly curved tool is required.

In using the mallet, the pupil from the beginning must get accustomed to holding it in both right and left hand. Do not let the pupils become right-handed, that is, so that they can use the mallet with one hand only. A good carver should be able to work both ways, changing the mallet from hand to hand just as the tool is changed from hand to hand, according to direction. Sometimes the entire background can be cut out this way, using the tool and mallet. It is a matter of choice to the individual. An expert carver will not consider the line or the drawing, but from the beginning will sweep out with a large, deep gouge as much of the background as possible, afterward shaping the different parts of the design. As soon as the whole design stands up clean and well drawn, and as soon as all the background has been removed from every part, the pupil must begin to model the raised part.

Carving the Raised Surface.—This is the most difficult part of the carving, and to be done skillfully requires that the pupils should feel form in the wood with the chisel, just as we feel it in the clay. Select the gouge according to the curve required on the scroll. Next carefully draw a line on the design representing the modeled edge, or the edge that stands up. Then take the gouge and scoop out the inside curve around each scroll to this line. Do a little at a time, gradually letting the chip grow smaller as we come to the end of the sweep. Usually we carve this out about half the depth of the wood, just as we have in the past modeled the form. Practice swinging the chisel in both bands around the curve, making clean, sharp cuts, the pressure being put on the chisel with one hand, while being

guided and held by the other. Most of the time in doing this work one wrist will rest firmly on the work. This support gives a kind of center and leverage that enables one to cut around the curves without much difficulty,

Illustration 323

Wood Carving

Two other positions of holding tools. Variety of carved panels in the background. These boys are carving portions of a very handsome piece of furniture.

each hand helping, one holding back and the other pushing. Curve out as carefully as possible the inside of each scroll.

Then take a chisel that is almost flat and bevel off the outer edge. This is a little more difficult and great care must be taken not to chip or break the modeled edge. The inside curve of each crocket must be scooped out and the outer edge beveled with a nearly flat chisel. Take care of the tips of the crockets. Do not under-cut them so that they chip off. It will not matter if some of the crockets are broken in the beginning. They can be

made smaller, and, if they break again, cut still smaller, or if necessary the design can be rendered without them. Because one crocket is spoiled, do not cut off all the other crockets. Practice on those also. It is very foolish to see some pupils, because they have spoiled or cut off by mistake one crocket, cut off all the others. Practice making each crocket, trying to keep it sharp and to get the curved edge and the bevel edge with facility.

Power in the Hand. —Two or three panels must be carved before one becomes familiar with the grain of the wood. In cutting around a single scroll, the direction of the chisel must usually be changed four times on account of the grain. This seems a little troublesome at the start and puzzles a beginner, but by the time we have cut half a dozen scrolls, the work begins to grow automatic. We no longer have to think about it, and attention can be confined to the shape which we are carving, the hands almost unconsciously having become aware of the texture of the wood in the different positions. This is the power that we wish to get, and pupils must be made to struggle with the wood till they reach this stage. It is an uncomfortable experience to pass through, and the first scroll may take perhaps one, two, or three hours to cut, when later, after facility is gained, it can be done in perhaps fifteen minutes.

Encourage the Pupil. —Remember, the wood is tough and unyielding. The pupils must be encouraged They must be told what to expect. Unless a pupil can see an expert cut the wood, the experience they receive in the beginning of lack of power is very depressing. But the wood will answer to every touch like plastic wax when once the capacity to carve is acquired. Therefore, again I say, encourage the pupils at this stage. Because occasionally a panel is spoiled, that is no reason why a pupil should be spoiled. The first stages of a carved panel are also very depressing to look at. It is the last few touches, the smoothing touches and the stamping of the background that make the essential difference. Scores of times in my experience I have found that the pupils who are most stupid in the beginning, the ones who make the most awkward attempts, who seem to be all thumbs and despair, are the ones who develop into skilled workers.

Do not, then, because the wood is hard and brittle and notched, and because struggling and strength and reliance are required, let the pupils fail to use these qualities. I consider that our children have learned a most valuable lesson when they become able to make a piece of tough wood

assume the desired beautiful shape. In reaching this stage they have had to exercise their patience, they have had to struggle with both hands and arms; they have had to compel their hands to obey their minds; and to do

Illustration 371

Wood Carving—Position in Malleting

Work of pupils should be displayed around the class rooms, as illustrated.

this, they have had to bring into application a knowledge of form and a care and precision that make them embody these qualities. They must not do all this once or a few times only, but they must form the habit till it becomes automatic.

The Value of Carving.—I regard carving as one of the best means, with modeling, to impress permanently and quickly fundamental forms, fixed concepts of form, in the minds of the children. It is comparatively easy to swing forms of grace and beauty on a blackboard or on a piece of paper. There is very little resistance offered to the hand. But is is a

different matter to swing these things in a tough piece of wood. I want the pupils to be able to look at a flat panel or a rough block of wood and to see its possibilities and potentialities. I want them to be able mentally to see the design in the wood, and with the fewest touches to form this pattern, not by picking it out, as too many often model and carve, bit by bit and chip by chip, but by freely drawing with the tools in the wood. This capacity can be acquired, and all good carvers have it, their work looking very different from that of amateurs.

Use of Finished Work.—It is important for children to see finished pieces of work. In all my class rooms, even in the night schools, we

Illustration 325

Wood Carving

Position when using the hand as a mallet. The hands should swing as freely as possible over the carving.

put all the finished work around the rooms a certain length of time, as may be observed in the illustrations. The pupils thus get ideas. They can see the application of the work, and can follow it in its different stages.

Another plan that I have pursued, is always to allow the children to own their work. It must not be kept by the school altogether, to be used for exhibition purposes, but should always belong to the child. I invariably let them take their pieces home for parents and friends to see; then if necessary they can be brought back and hung up a certain length of time, usually till after the spring exhibition, when all work is carried home by the pupils. Those who are the most discouraged in carving, who find that it is almost impossible to work out the backgrounds and to struggle with the tough wood in the hard places and in the corners, where it is so difficult to remove, are the very ones who need the work the most.

For educational purposes, experience has taught me that a certain proportion of children will dislike drawing on a surface, a certain proportion will dislike clay work, and a certain proportion will dislike carving in wood. Frequently these are the very pupils who do exceptionally well in the other departments. Do not let them for this reason work only in those departments. It is in cases like this that we need the value of the work as discipline. I have never known a pupil, because he liked modeling and disliked carving, to stop work altogether because he was made to carve. He doesthe carving because it is part of the course,and the modeling because he likes it, or the reverse. After a while all the pupils are intelligent enough to realize the value of each department as training, and are willing to pursue it irrespective of their likes and dislikes.

As a Training.—The bitter must be taken with the sweet. Never allow pupils to elect the branch in which they should work, unless in case of constitutional defect, when exceptions can be made; for instance, when the pupil is a cripple or is physically weak. There is a great disposition among parents, and even among teachers, to let children " do as they will, rather than to make them do as they ought. Moral habits must be formed in children long before you can teach moral principles. In the end the teacher is always justified in the mind of the child when he comes to realize the value of the habit, and later of the principle."* Carving compels attention mentally and visually, in combination with a certain amount of

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*Dr. Phillip S. Moxom.

muscular energy that must be exerted, a certain amount of disposition to tug and pull the tough, resisting wood into shape.

Persistent activity that requires the use of a close grip with both hands, and that requires all the muscles of the arm and the thorax to be actively

Illustration 326

One Position of Hand in Gouging

Usually the tools are kept turned in one direction on the bench, with sharpening stone and mallet near to hand.

engaged, is good for the growing children. They are compelled to exert themselves in the very parts of their being that are but little used and are allowed to be torpid most of the time in schools. The chest muscles, the

breathing muscles, the muscles of the arm and the upper part of the body, are all actively exercised in carving. This is doubly valuable to children, because their school work gives them a disposition to lack energy, making them torpid in a measure. I have seen children who are actually too tired through the training they have had, to be willing to grip the handle tight for a continuous period. This is a very bad condition for the pupil to be in, and carving in nearly every case removes it. If a carver has any capacity at all, it will be generally found that he has splendid grip, caused by clutching handles for a certain purpose. We want this capacity in our children, and I believe there is a very firm connection between mental grip and physical grip.

Carving also is unlike sawing and planing, and a good many other operations that merely require the use of strength without much mental effort, since every touch of the chisel in carving must be guided by intelligence. There is no mechanical work about it. The pupil cannot use instruments of precision or other mechanical aid. There is no method by which original carving can be done without the use of the mind.* To prevent cutting too far he must exercise continuously the eye, the hand, and the intelligence, and the hands must continually follow certains forms or lines and those only. That is the reason carving, in combination with drawing and modeling, takes a so much higher rank than all the mechanical methods or the mere teaching of a trade, or those amateur systems of knife-work, where a few feeble constructions are made that have been thought out by the teacher,—repetitions of other people's ideas, and where amateur tools are used.

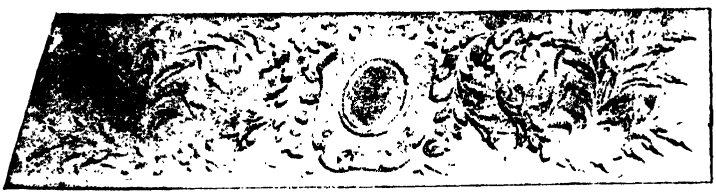
Finishing the Carving.—When the carving has been modeled so far as the pupil can do it, the background can be finished by stamping or left exposed, showing the chisel marks. The former is done by going all over the surface with the point of a stamp, of course using the mallet to apply force. A stamp may be made of a big nail filed on the end to the desired shape. Rough or fine backgrounds can be made as desired. This throws out the design and makes the background even.

Carving and modeling are much superior means of compelling obser-

* Machines are now constructed that can copy carving very exactly. But the original piece must first be carved or modeled by the hand and mind.

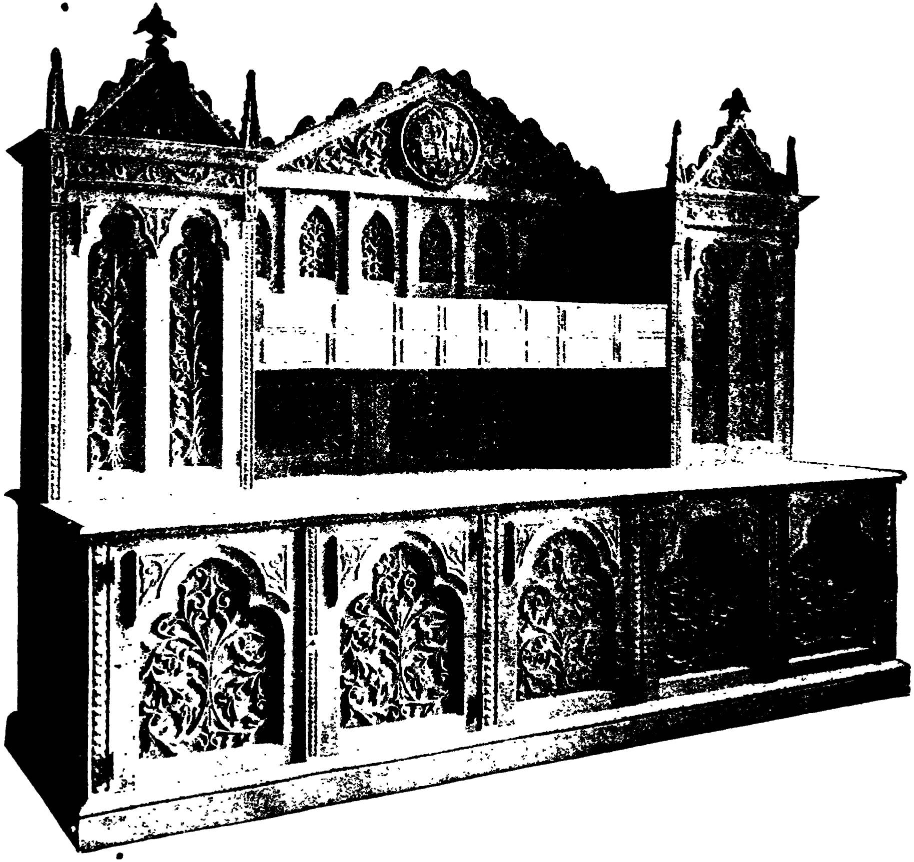
vation than simple drawing; on account of the forms having been made, they become fixed in the mind permanently, when in drawing or in looking, alone, this is not always the case. After modeling or carving, usually the first time, all the pupils remark the fact that they notice shapes that they have never seen before on the most familiar objects—fences, gratings, buildings, and so on.

It is a fact that not one person in a hundred knows the shape of some of the most familiar forms till they have actually made them. By knowing, I mean, to be able to reconstruct in any way the *actual form. They* usually have only a partial concept, and the universal peculiarity that is remarked among modelers and carvers is the new way they have come to look at things. They perceive things that they had never noticed before in their environment, and they cannot help but speak of them continually. This is simply nothing more or less than that they are beginning to observe to some purpose for the first time in their lives, and are also beginning to put their powers of observation into practice. They assimilate the differences and resemblances of things that they see and embody them in a work of their own hands and mind's. In other words, "they have added another weapon to their arsenal of power."



Carved Panel.

PLATE TWENTY-THREE



Vestment Case, Carved by Pupils of the R. C. High School

Carved by High School Boy

CHAPTER III

Carving the Elementary Units of Design

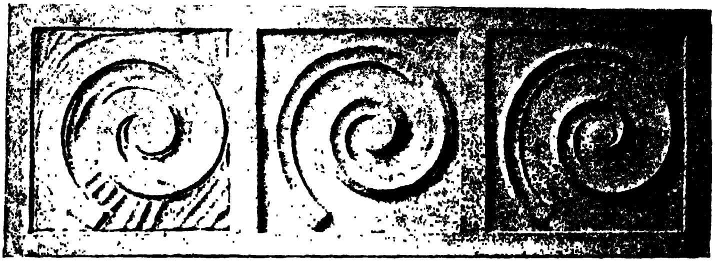
IN THIS CHAPTER are given instructions in carving some of the units of design and simple forms used for elementary work in drawing and modeling. In most of my carving classes all the pupils are engaged in making these forms in combination, in designs on panels, etc., to be used for various purposes. For convenience in describing methods, however, the units have been carved to show three stages or steps in the work—(1) the form grooved out, (2) the form nearly finished, (3) quite finished. If these cuts are studied attentively, the work of carving can be readily performed.

The Scroll.—The form is first carefully drawn in chalk until it fits the desired space, then in soft lead pencil to make it show plainly. Then a line is gouged around the form as shown in Illus. 329, being careful not to cut the pattern and to get clean, clear curves. Then the background is partly gouged out. The second step is to cut down around the form to the required depth and then to smooth the background. The raised part can then

be modeled, with a curved surface on the inside of the scroll and a slope on the outside, being careful not to cut more than half-way down to the background.

One can readily see what valuable training is given to the hand and the

Illustration 329

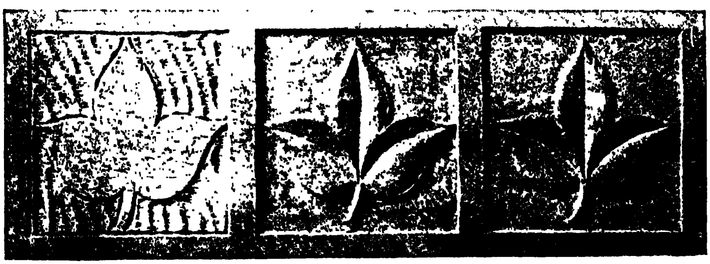


Carving the Scroll

The first part shows the beginning of the work, the form being grooved out; the second partly completed; the third is the finished carving of this simple scroll.

eye, when the pupils can swing these curves freehand in the tough, unyielding wood. What a valuable training it is, in enabling the hand to swing accurate and true forms on paper or surface of any kind.

Illustration 330



Carving the Leaf—Three Stages

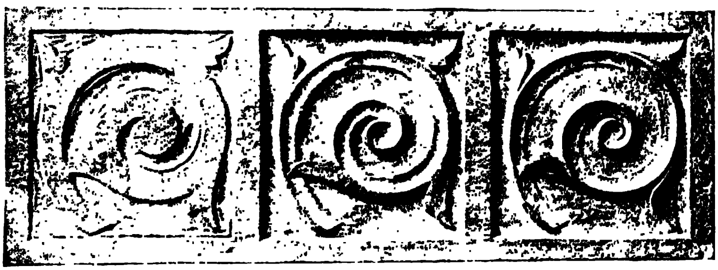
The Simple Leaf.—The leaf in this example (Illus. 330) is made about the same in proportion as the leaf used in drill work and for modeling. When the leaf has been carved the form is more vividly remembered and the

magnitude grasped better than through merely drawing and modeling it. To know this simple form accurately is a help in making all other forms.

The form is first drawn in chalk; when the proportions suit, with soft lead pencil. Then gouge the outline and remove background, as illustrated in the first stage. Now sink the background and partly form the surface of the leaf. Third, finish curves and ribs. Every touch with tool will help the student to embody the shape and draw it better.

The Spiral With Crockets.—This form (Illus. 331) is more elaborate and is made in the same way as the spiral. The crockets make it harder to carve, because they interrupt the curves, but with a little practice the forms can be made to flow out with fine tangential curvature. It is difficult, at first, to make the corners free and clean; they will chip off, but a little care will prevent it. The raised edge, or modeled line, is hard to make fine and

Illustration 331



Carving Spiral Crockets—The Three Steps

clean the first few times; it is difficult to prevent it being angular,—gradual transition from curve to curve is necessary. Right here the pupil receives experience in persistence, application, patience, combined with co-operation of hand, eye and mind. All this has an important influence in forming habits of industry and a love for work, as well as its influence manually and mentally.

The Anthemion. (Illus. 332.)—Let this be drawn in chalk, then in pencil. Then (1) remove background, (2) next deepen the background and partly model the various lobes, and (3) then finish the panel. To keep the long narrow parts of the lobes clean and slender is hard, but with practice

all the forms can be nicely modeled with the tools. Use a nearly flat curve for this finishing work, and "feel" the curves with the hand continually. The tool should cut convex curves all over the lobes.

All the various units of form should be carved repeatedly in various designs suitable for use as panels or enrichments for furniture, etc. All the models in the various parts of this work are suitable for carving.

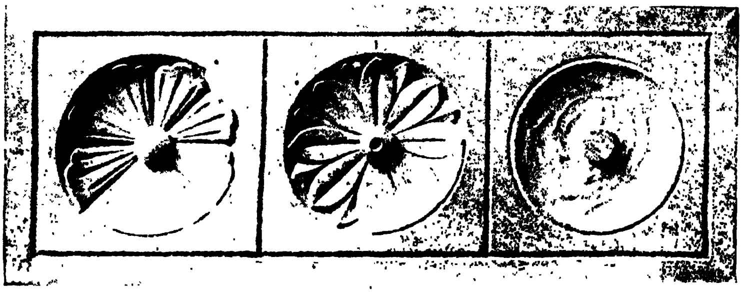
Rosettes are forms frequently required in carving, and to cut some of them in wood gives a wonderful accuracy and fitness. The calipers are used to strike the circle (Illus. 333), and the little boss in the center of the circle. The wood can then be scooped out with the gouge. On this curved surface the leaflets can then be drawn. With a curved chisel cut down the edges, and with a parting tool make the ribs down the center of each leaflet. Remember, the tips stand up and the background curves in quite deep, the entire rosette being below the surface of the piece of wood. The stages can be seen at 333, first a part lead-penciled, then the midrib partly cut, and the leaflets at the back. These forms are simply intended for suggestions, and the actual forms should be studied from examples that can readily be seen in many places. A second form is suggested at *c* in Illus. 333, partly finished and then completely finished. Pursue the same plan in making this form and its variations.

Square Rosettes can also be made (Illus. 334). Mark out the form with ruler, put on the diagonals of the square, make the little circle to represent the boss in the middle of the rosette, and draw the inner square. Next cut around the edge of the leaves with the chisel and sink the middle part of the leaf, then trim out with a nearly flat chisel the points between the leaves; next, sink the background still deeper, and put the finishing touches on with the gouge, as illustrated. In all this work requiring the repetition of similar forms, we allow the use of the ruler and the compass, simply to save time. The actual form is cut with the hand many times, even when the lead-pencil marks have been cut away, so that it is freehand carving, and it is simply for convenience that we space off with the calipers. Of coirse the spacing also might be done with the aid of the eye alone, but it would never look quite as well. It is only in patterns of this kind, like frets, rosettes and moldings, where there is constant repetition, that we ever use the ruler or the compass. In all other work and designs of different kinds, the eye alone is used.

Illustration 332

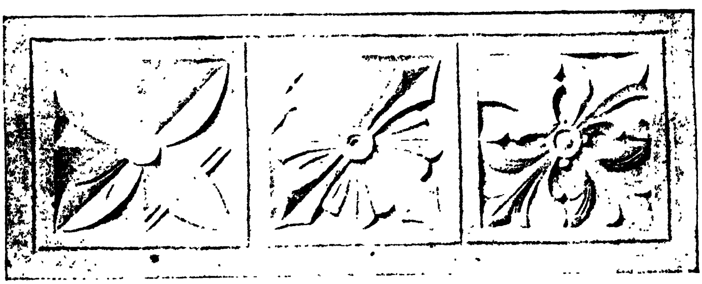
Carving the Anthemion

Illustration 333



Carving Round Rosettes

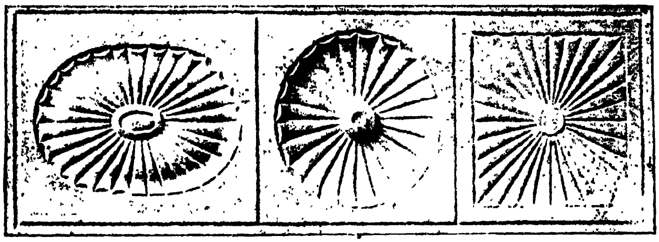
Illustration 334



Carving Square Rosettes

The next rosette form in the square is a little more difficult, *b*. (Illus 334.) Place diagonals of the square, as before, make the center boss and then mark out the darts and the scalloped leaf behind the darts. Then with a chisel cut down the outline of the form and remove the background. In making the center of the darts, cut the middle line first quite deep, and then slope down to it with a nearly flat chisel. The curved edges of the form

Illustration 335 c b a



Carving Fluted Forms

can then be made and the ribs gouged out. Pupils should be encouraged to make varieties of these rosette forms.

The next rosette is still more complex, and represents a conventional leaf running out to the four corners, *c*, Illus. 334. Draw the form with a soft pencil first, then cut down with a partly curved chisel, remove the background, gouge out the sides of the leaves, as shown in illustration, and round over with a nearly flat tool. The balls can next be modeled and the veins on the leaves gouged out. The background is then finished by stamping.

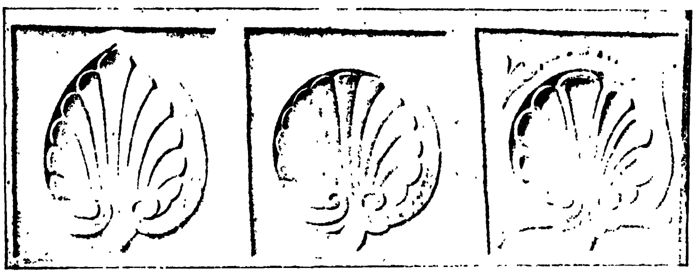
Fluted Forms are also used for a variety of purposes in carving (See Illus. 335.) Mark out the surface to be filled, then the center, then with a parting tool make a set of lines ray out from the center, and curve over with the chisel, lastly making the curved surface at the end of each ray, as in *a*.

The fluted form in a circle (*b*) is more difficult. It is sunk in the wood below the surface, and a concave form must first be made, leaving the center boss standing up Then make the rays around the circle with the parting tool and curve over. Lastly finish the edges with sharp, clean cuts. The next is a still harder rendering of the same form and the ellipse, with the fluting

making a double curve, as at *c*, Illus. 335. The general form must first be hollowed in the surface, then the form may be drawn with the pencil and made as before. It is excellent discipline to make each one of these curve and diminish gradually. An exceeding amount of patience is required, which is valuable discipline for any one. A steady hand and a true eye are demanded, and if these are properly employed there is a sure return, and a product that is valuable, useful, and beautiful.

Conventionalized Forms for Carving.—The next illustration consists of conventioalized shell forms, 336. These are made the same way as the forms just described. The shape is to be drawn with the pencil, the surface sunk to the desired depth, and then the flutings or lobes are to be carved. Shell forms are among the most beautiful forms that can be made in wood. They seem especially appropriate, and endless is the variety of beautiful results that can be obtained by simply changing the depth and the

Illustration 336

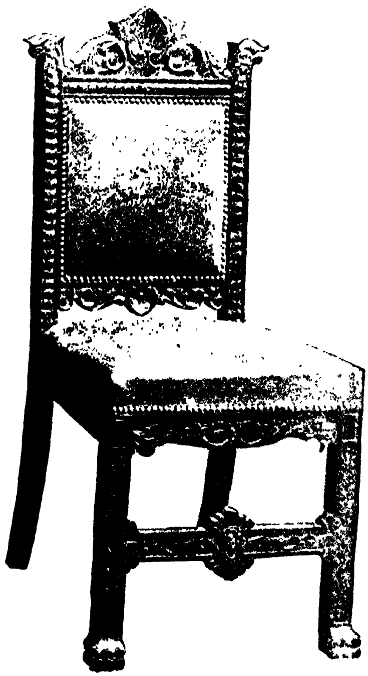


Carvings of Conventionalized Shell Forms

relief of the carving. Sometimes they look very beautiful when scooped in quite deeply, at other times when they are raised up in high relief.

After a few simple forms have been made, like those illustrated, many others are sure to be observed, and fine carved work of different kinds, and the pupil will soon have a desire to make them, and the carving of simple forms will readily enable one to grasp the more complex forms when they are seen. Carving, actually making these shapes in the tough wood, is the best means that I know of for making permanent records of form. This

is the reason that carving is one of the essential branches in this method of training. Many elaborate pieces of carved furniture have been made by the members of the teachers' classes at the art school. They work very faithfully and it is valuable as an offset to their sedentary work at the schools.



Carved by Teacher of the Public Schools

Carving on a Curved Surface

This piece of work, a heavy frame, is clamped in the bench and shows position of hands in carving on the curved surface. The carving is to extend all around the frame.

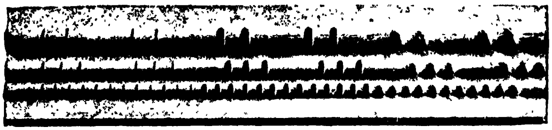
CHAPTER IV

Carving on Furniture and Other Advanced Work

CARVING IN RELIEF ON CURVED SURFACES.—Pupils must get skill in carving in relief and on curved surfaces, as well as in flat carving. They should make several panels in the flat, however, before attempting work in relief. The borders illustrated herewith (339 to 344 are simple and can be used for a variety of

purposes in the enrichment of furniture, as can be seen by the various illustrations. In making the first strip, which consists of a series of beads of different proportions (Illus. 339), it is necessary to use the calipers,—a pair with a screw preferred. The calipers must be sharply pointed, and by fixing it to the size required, being careful to screw it tightly, the length

Illustration 339



Beaded Surface Border

Illustration 340

Tongue and Dart Molding

of each bead can be accurately marked with the point. As soon as this is done, take a flat chisel and make a slight indentation between each two beads. Enlarge this till it is of the size illustrated, and then with several flat tools, of small size, model each ball or curve. It is quite hard to make them even and equal. If one is cut too small, by accident, do not make the rest so. Go on with the work, making them the proper sizes.

A spoiled one can be cut off and a piece of wood glued on again to be carved. Almost all forms carved in wood can be repaired in this way. It is almost impossible for skilled carvers not to break off occasional pieces. These can be glued on again, or, if lost, another piece of wood can be glued on and then cut to the desired shape. It is very stupid to see a pupil cut off all the elevations or points or crockets, as the case may be, simply because one or two are broken or spoiled in cutting.

The Next Piece of Molding is the tongue and dart, or egg-dart molding, (Illus. 340.) It is seen frequently in wood and stone, and is considered to be one of the best of all moldings. All of these pieces of wood have been shaped by machinery first, and can be purchased, with the desired curve, at almost any mill. It is not necessary for the student to do this preliminary work; it would simply be a waste of time. This design is also to be marked out with the calipers in the beginning, being sure to get the ovals or tongues equal in size, and to make them of such size that the required number will fill the space. This must be done by marking or measuring off the entire surface first. As soon as it is spaced out with the calipers, take a soft pencil and draw the outline of the raised edges. Next take a parting tool and form the outline of the tongue and the darts. (See cut.) The next step is to deepen this, as illustrated, then to make the curve on the tongue and to form the two slopes, making the dart. The background can next be cleaned out and the further depression made on the dart. This work requires considerable care and accurate cutting to make the darts look even, and is very good discipline. It is best not quite to finish several forms,--simply to block them out and then go over them again when the hand is more accustomed to the form.

The next molding is made on a single curved piece, and contains the dart and double curves, producing a more elaborate form. (Illus. 341.)

Illustration 341

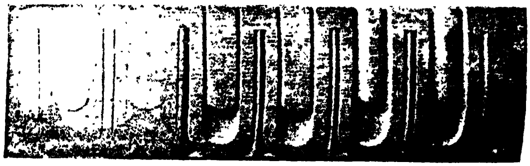
Plain Curved Molding

This must be marked out with the calipers, picking out all the points and distances, after which the forms should be drawn with a soft pencil. The midrib can next be marked out with the parting tool and the double curve made with a small gouge. A larger gouge can then be used and the form modeled over to the groove with a nearly flat chisel. Next work out the

dart, keeping a sharp edge down the center and making the corners sharp and clean.

Another Easy Molding requiring great care, however, can be made on the same curve, as illustrated in No. 342. This is to be spaced off with the calipers, after which the form can be drawn with the soft pencil. Use a small gouge to start the outline of the curved forms, and the straight chisel or a parting tool to start the darts. The form can then be finished as illustrated. The next two forms (343 and 344) are complex, making use of the acanthus leaf curling over at the top. This yields a very beautiful series of forms for elaborate work. Mark out carefully with the calipers the size or space to be occupied by each leaf, then draw each leaf carefully with a soft pencil, as illustrated in the first stage. The form can then be cut in with a curved chisel, using the parting tool to make the rib up the center of each leaf. Next, lower the surface between each two leaves, the rib of the partly seen leaf to remain raised. Then the pipes and undulations on the leaflets can be modeled with different-sized gouges

Illustration 342



Plain Curved Molding

Illustration 343

Acanthus Leaf Molding

and flat curves. The top of the leaf can also be cut down and modeled over, allowing the molding to show behind each leaf. It will be found quite difficult to get the edge to run straight. The spaces between the leaves at the top must be made rather deep. The four stages are well shown in the accompanying cut (344).

Another style, on the same kind of molding, is shown in the next illustration. Some find this a little harder and some find it easier to make than the other one. It is to be done in the same way, marking out with the calipers, as before, the space to be occupied by each leaflet, then cutting down with the curved chisel the edge of the leaflet, as shown in the illustration, then sinking the part around the leaf, allowing the partly seen leaf to stand up in the middle. The surface is modeled by making the ridges and forming two sloping surfaces running to the end of each leaflet. It is a little difficult to make all these pipes equal in the beginning. All of

Illustration 344

Acanthus Leaf Molding

this work should be cut in oak at first. This wood is a little tough and is not so liable to chip as walnut, cherry or mahogany. Disaster is sure to happen in a few places at first, but when the leaflet has been carved a number of times, it can be done with ease.

The Next Piece of Carving illustrated is elaborate, and should not be attempted unless the pupil has modeled the form in clay a number of times. The shell form is one that is frequently used in carving, and, with the leaf, forms a nice shape to be used for many purposes, for instance, on a cornice, on a chair back or part of a settee, on picture frames, and so on.

It is best not to copy these very elaborate forms from the illustrations. This would prove a little too difficult. They are simply placed here as

examples of carving. Students will see carving of all kinds when their eyes become opened through the work, and good examples may be seen in wood, stone and metal on different buildings, which can be reproduced. It is only by frequent observation that pupils become aware of form and ac-

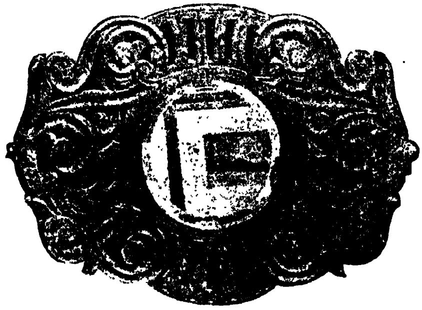
Illustration 345

Partly Carved Piece, Suitable for Chair Back

tually notice shape. Every time a different piece of work is carved, the student will have increased ability to perceive various forms.

Forms Suitable for Carving.—Illustrations 346 and 347 show a variety of frames that can be made of different sizes for many different purposes. Made with narrow borders they are very suitable for water colors

Illustrations 346-347

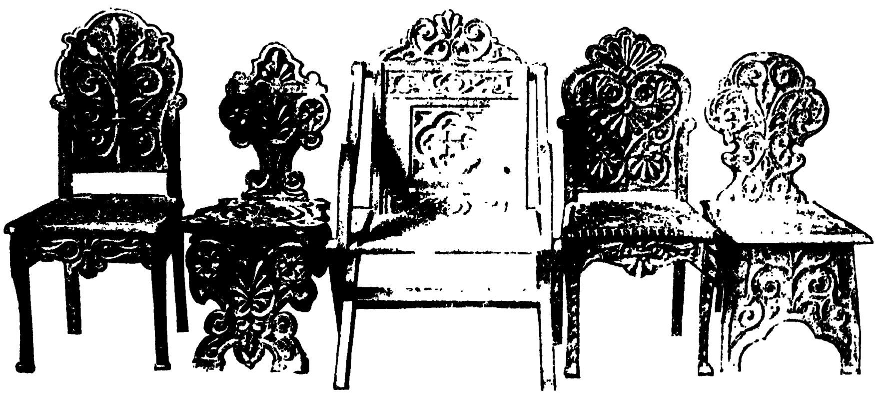


Frames Carved by Night School Pupils

and engravings; made much heavier and of thicker wood they are suitable for oil colors and mirrors; made still larger, and with metal hat pins, they are suitable for hat racks, and are convenient pieces of furniture to have in different parts of the house.

The series of chairs illustrated show a variety of shapes. (Illus. 348.) Some of them may appear to be overloaded with carving. This is simply a matter of economy, and though I know the forms in some cases will be better if they were not carved so much, it is simply to provide surfaces for work that they were made originally. Some of these chairs consist of five pieces, each piece of which is heavily carved, thus affording the pupils several hours of work on each. The blanks for the chairs vary in price, some \$3 to \$5, according to the amount of labor expended upon them. The chairs are usually delivered in the white and doweled together, so that they

Illustration 348



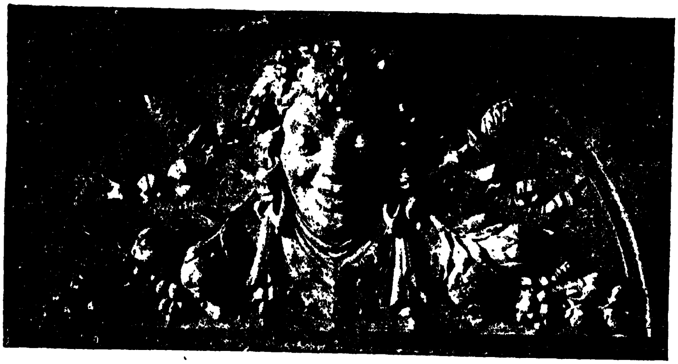
Chairs Designed and Carved by Public School Pupils

can be taken apart with a few taps of the mallet and carved. Two or three chairs will thus furnish occupation for a whole class for a number of periods.

The designs are in no two cases alike. This will be found true with regard to every pattern in any material made by any of our classes, each child according to its capacity creating the forms most suited for use. I do not pretend to defend all the patterns. In some cases they are crude and could be made much better, but being the work that the child sometimes started before the teachers could modify or criticise, it has been finished and must stand on its merits. It is very easy for a good teacher to give good lessons in designing and construction, using as examples the good patterns or the bad ones made by the class. Examples of poor work therefore teach by

Illustrations 349-350

Male



Female

Italian Renascence Carving by Farari, in the Studio of the Author

contrast. No class of people perceive errors and faults in designing and construction quicker than children. Usually they will be found to select the best. There is an endless variety of forms that afford practice for work in wood. Chests of various sizes can be made with six, eight, ten or twelve panels. Settees also give opportunity for large pieces of work and can be carved liberally all over. A variety of small work can be made, like book-racks, mirror-backs, screens, cabinets, closets, hanging shelves. Clock cases, half size and full length, are in demand and usually find a ready sale. Carving is work especially appropriate for children, for the reason that they are embodying value in the material upon which they work. This

they realize from the beginning. They are also learning the value of persistent hard work, and they get a certain amount of knowledge of art forms and real drawing that cannot be acquired in any other way. Their taste and appreciation of common things around them is enlarged, and the works of their hands usually enter into a great many places where taste and appreciation are lacking, and thus act as missionaries. This is especially true of the night schools.

I am much surprised to notice the small number of schools among all the art institutions of the country where carving is thoroughly taught. It

Illustration 351-354

1—The Plain Block 2—The Form Begun

3—Carving More Advanced 4—The Finished Work

Carving a Cupid's Head

is taught in some, but in the larger number it is entirely neglected. Making form in tough, resisting material is one of the truest and best methods of

gaining permanent and organic ideas of form. Surely this is especially important to the art workers in the higher fields of art. It certainly was a part of the education of some of the greatest of the old masters, who frequently carved in stone and other materials. The energy and diligence begotten by carving, where it is properly taught, are also of the utmost value in counteracting the disinclination to manual effort that occurs so often in children whose school hours are largely occupied with book studies. This fostering of an energetic disposition, along with true ideas of elementary art, is by no means the least important benefit of wood carving and real manual training. Most of us have got to work for a living, and education should give us energy for work instead of a disinclination for it. Not only this, but carving compels accuracy, attention to details, the doing of things well, in contradistinction to the carelessness in the work of one's hands which is sometimes begotten in children who learn from books alone. The carver, whether self-taught or learning from an instructor, will quickly see that slovenly work will show, that the carving will reflect something of his own character. The pupil will also recognize the difference between the result when he tries to do his best, or when he is careless. The wood will tell the truth, always an important lesson.

Carving in the Round. —In this part only a suggestion of what can be done is possible. In another volume I shall give detailed instruction in all kinds of wood carving, with many examples of all the styles. Very beautiful examples of wood carving still exist, made by artists of different periods. Wood of different kinds, especially the Italian chestnut, is suitable for sculptor's work, and very elaborate work may be seen in Italy of groups of figures, etc. Examples of fine modern Italian carving are given in Illus. 349 and 350, made by Farari.

The series of four cuts on the previous page show the successive stages in blocking out a Cupid's head with wings: 1, the plain block made of several pieces of wood glued together; 2, the same partly carved with form in the rough; 3, the head and wings showing distinctly, but still unfinished; 4, the work as it appears finished.

Two examples are given of winged griffins suitable for the arms of settees (Illus. 355-356). The first is shown partly carved, with the form only just beginning to show the intention. The block of wood is three inches thick and is a piece of mahogany. It is clamped on the benches, as shown

in some of the other pictures of pupils working, and is being made by one of the advanced pupils of studio classes. The second form shows a similar piece of work of different design entirely finished. The body consists of one block of wood, the wing being an addition after the other part has been carved. Work of this character cannot be done unless the pupils have a vivid memory of form and have had good manual training.

Dolphins are frequently carved in wood, and the following example (Illus. 357) is frequently cut by some of the pupils. The form is changed and modified to suit any purpose, and is comparatively easy to cut. Both sides are carved, and it makes a suitable arm for chair or hall bench.

A great variety of forms, such as iron and brass castings, or gas fixtures, grills and other ornamental objects, are first carved in wood and then used as patterns for making the castings. Several examples are given of forms of this kind, also architectural detail for interior work, such as caps, pilasters, panels, rosettes, etc.

Illustration 355

Arm for Settee

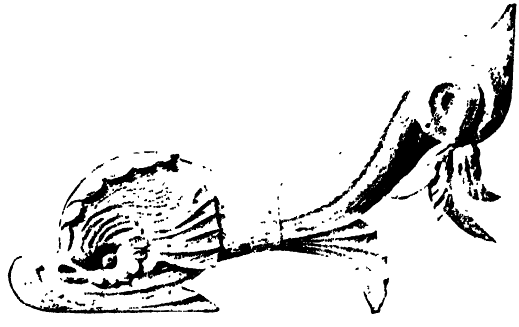
This illustrates the block of wood partly carved, with the head wings, etc., in the rough. The form is carved on both sides.

Illustration 356

Another Arm for Settee

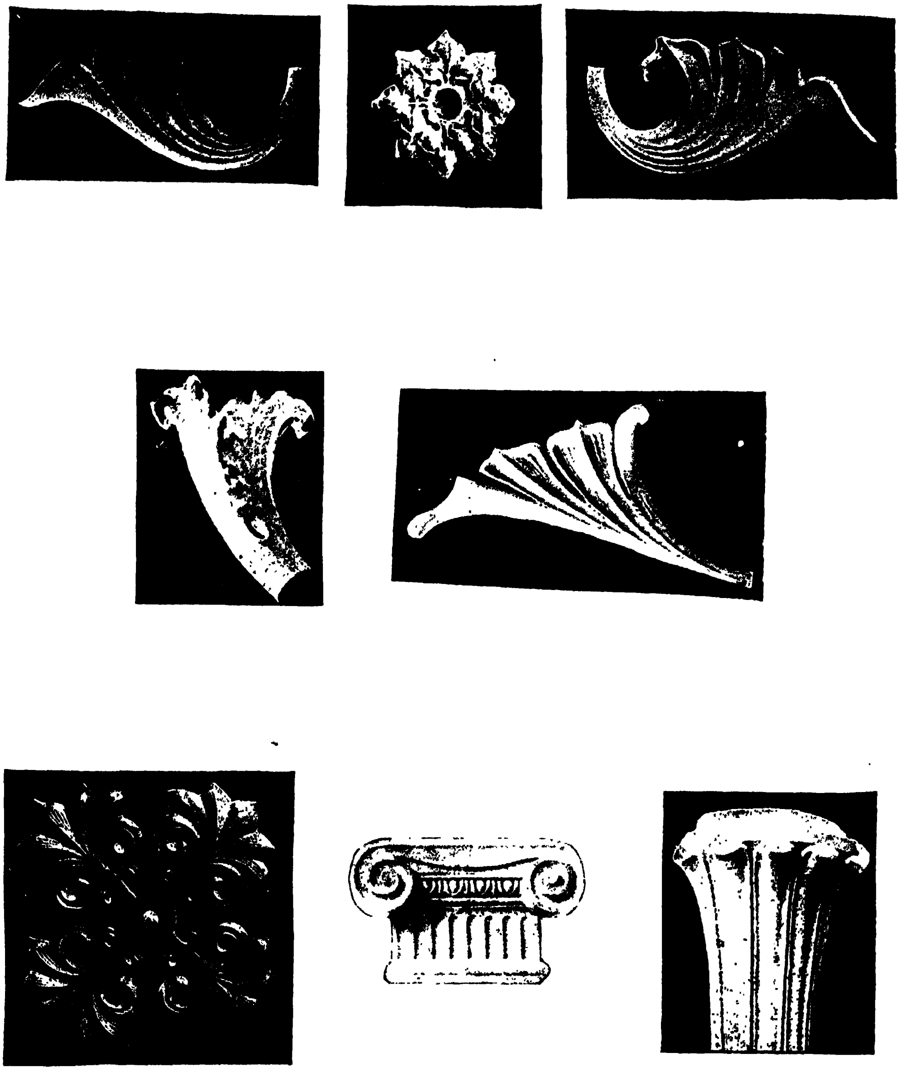
This is another form of similar character completely finished.

Illustration 357



Dolphin Arm for Chair

Illustrations 358-365

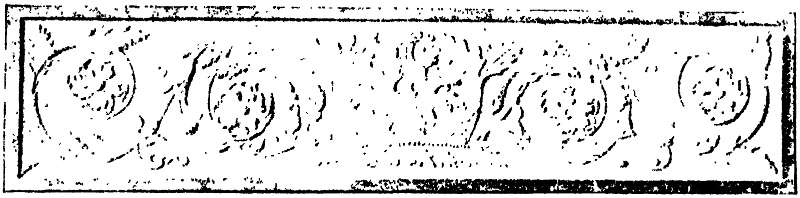


Carved Patterns for Metal

These designs are carved in wood for various purposes, to be cast in metal. Many patterns for brass work, gas and electric light fixtures, etc., are carved in wood first.

BOOK FIVE

Various Applications of Art Methods, Real Manual Training and Nature Study



1. CONSTRUCTION—Mechanical Drawing and Wood-Working

2. CORRELATION of Art, Real Manual Training and Nature Study with Other Instruction

3. SPECIAL SCHOOLS —(*a*) Night Schools, (*b*) Vacation Schools, (*c*) Normal Schools, (*d*) Summer Schools

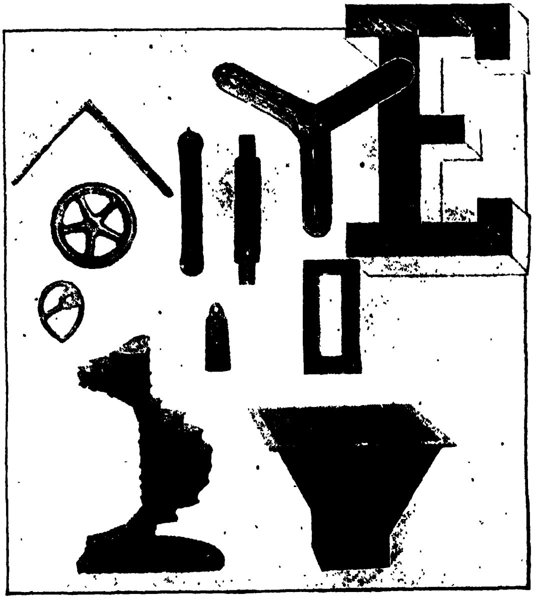
4. OTHER APPLICATIONS—(*a*) Decorating School Rooms, (*b*) Backward Pupils, (*c*) Insane and Feeble Minded, (*d*) Truant Schools, (*e*) Reformatory Institutions, (*f*) Miscellaneous

5. THE FINE ARTS—Some Suggestions for Art Students

Mechanical Drawing

CHAPTER I

Construction in Woodwork and Mechanical Drawing



Pattern Making

Various patterns made by the boys, to be cast in metal.

EXPERIENCE leads me to believe that constructive work as taught in many schools, similar to joinery or cabinet-making, and mechanical draughting, are of little value educationally, except to the specialist, without previous training in the art work and real manual training I have been advocating in the preceding chapters. When pupils have acquired a certain dexterity of hand and accuracy of eye and are able to draw, model and carve reasonably well, then it is of advantage for them to attempt constructive work and mechanical drawing. They should then be about 14 years of age, or ready for the high school, and should have acquired complete control of their hands in manual dexterity, and be able to draw fairly well and observe accurately. Then, and not until then, are they ready for tools and tool-processes and instruments of precision.

The fallacy of teaching boys carpenter work or mechanical draught-

ing without this elementary experience in real manual training is illustrated in nearly all the pupils issuing from the so-called manual-training schools: beyond the limited trade processes in which they have been trained, they

Illustration 367

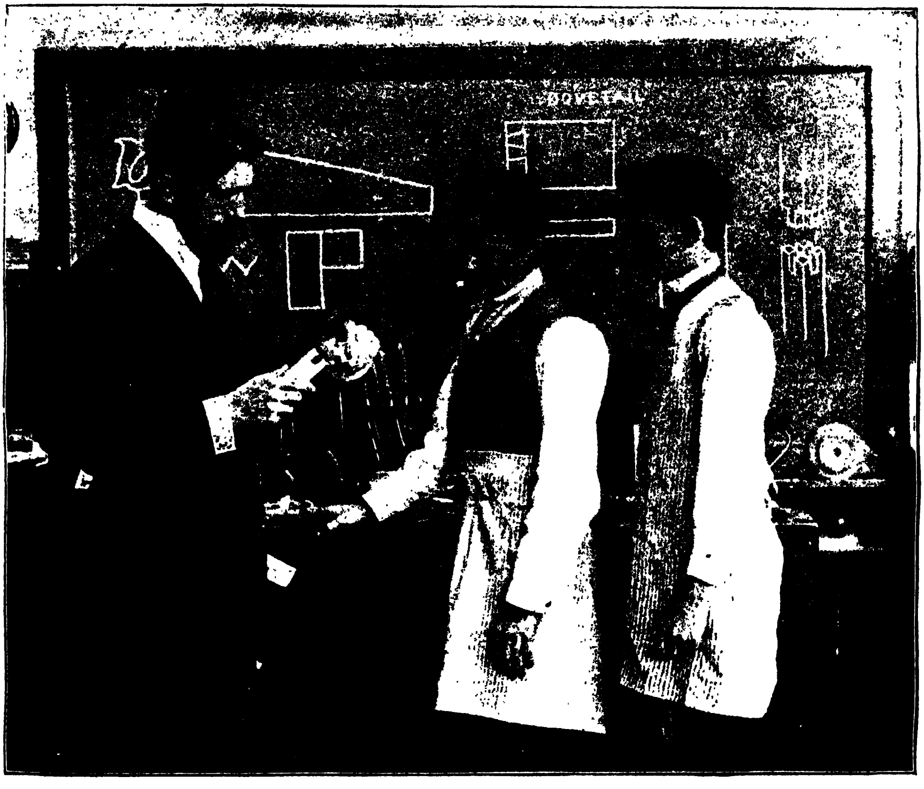
Wood Working
A lesson in sawing. All forms are made from rough timber, the boys cutting it from planks as required.

do not have manual dexterity. Any ordinary test will show this. Few of such graduates can do even the elementary art work illustrated in this book They lack the ability to make the hand obey eye or mind in doing work outside of the few processes in which it is trained, and are of course almost wholly deficient on the art side.

A Radical Feature of our manual-training method is the absence of machinery, steam power, turning lathes, etc. Machine-shop methods have never yet produced and will never produce craftsmen who are mechanically and artistically equal to those of the best periods of history. Of course thi

is an industrial age, and our material progress so far has depended largely on the harnessed power of steam, electricity, etc., but in a measure this has been at the expense of the individual. No system of education or progress can afford to miss the lessons of the great periods in craftsmanship, when the individual workers put their soul, feelings and emotions into the work of

Illustration 368



Making Joints

A rough freehand drawing of the joint under discussion is shown on the blackboard. The teacher is testing its fitness.

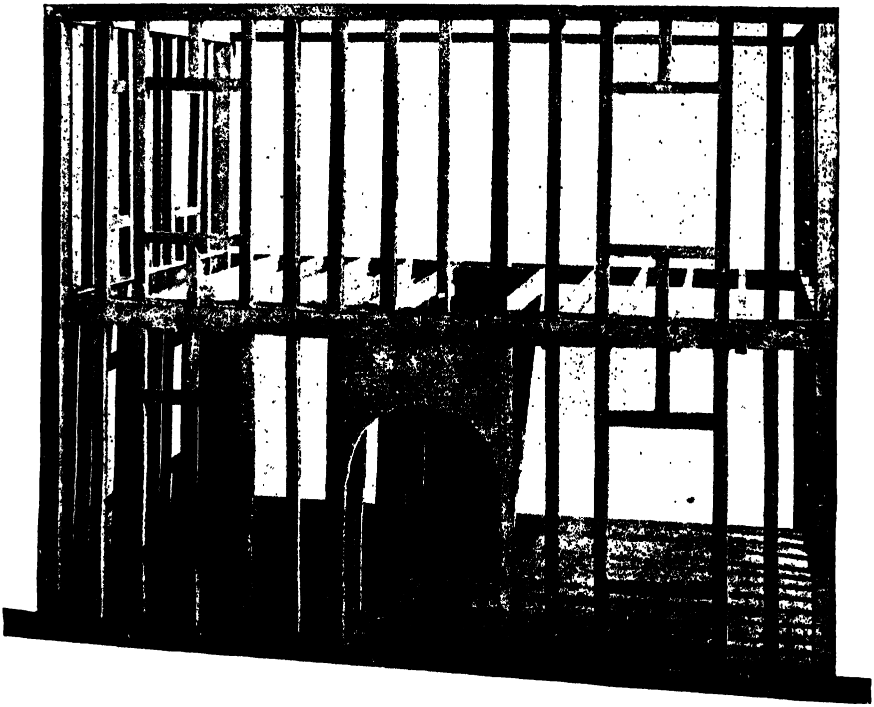
their hands in stone, metal and wood. We are far from equaling the buildings and masonry of the past, and our mechanics and common people scarcely realize what artistic excellence means in metal, stone and wood.

Part of Wood-Working Room

Twenty boys rotate each period into this department from the mechanical drawing room. They have had the elementary drawing, modeling and carving for two years. Courses are here given in cabinet work, pattern making and building. The work is all done by hand, no machinery being employed.

The idea is too common that a manual-training school should be a machine shop. This was one of the many forms of so-called manual training that the author early tried and found wanting. The deficiencies of machine-shop practice for the purposes of educating hand and eye, as well as brain, are now generally recognized among progressive educators, but

Illustration 369



Building Construction

Unfinished model of simple frame building, showing detail construction. Work of this kind is of the greatest practical value to the boys, and gives excellent opportunity to correlate mechanical drawing.

these deficiencies are all the more pronounced when boys are put into machine-shop practice without the elementary training already advocated.

It is not denied that using machines gives some skill, and that they are in their proper place in the trade school, but there are many operations for handwork in constructions of various kinds that produce more skill and

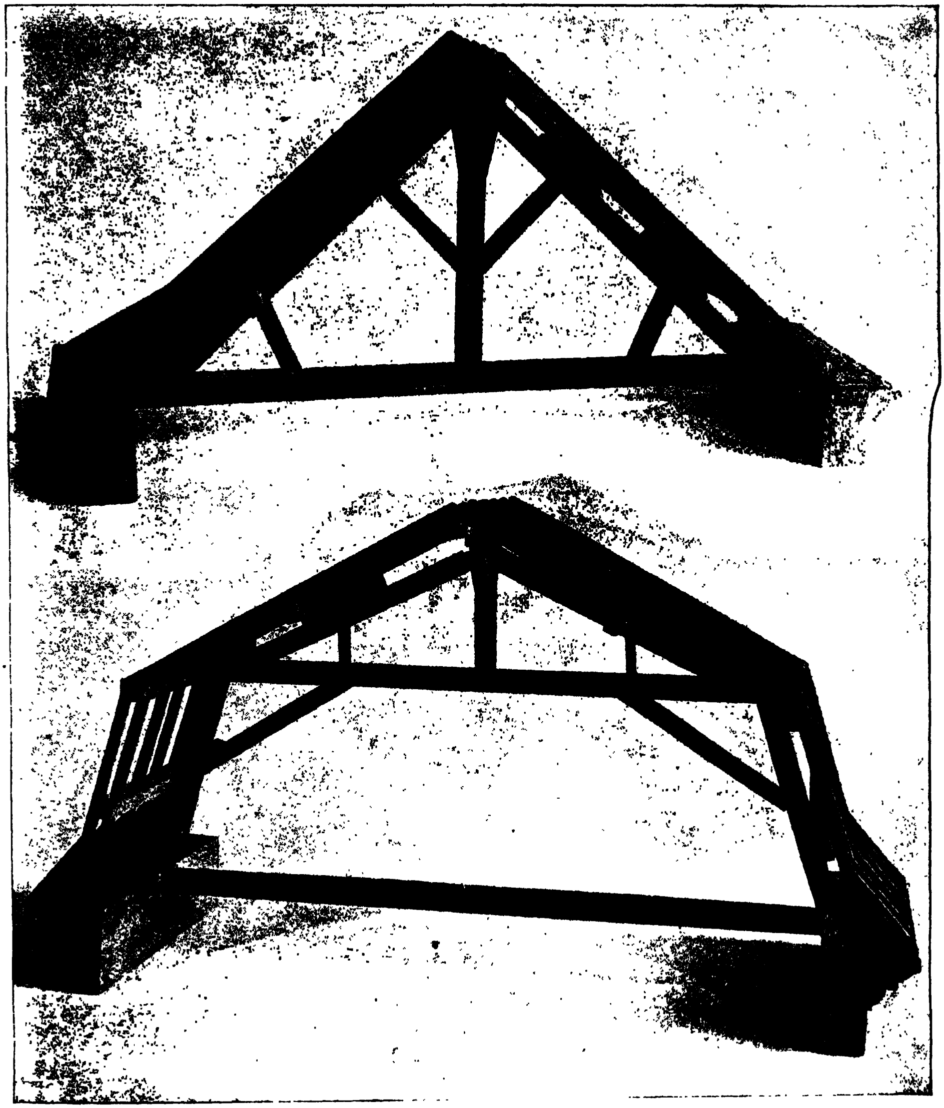
facility, and therefore these are more educational. The time of the young during the nascent period is too precious to be wasted in teaching them how to use machines; it should be devoted to the development of their own organism, to the training of eye and hand as well as of mind.

The whole tendency of modern industry is to make machines of us soon enough, and how pitiful the narrowness of life, the one-sided development, of the millions whose capacity is measured only by their ability to operate an ingenious machine. The fact that many occupations and trades do thus confine both mind and body within a stultifying range, is all the more reason for so developing the mind and body that, while doing to perfection even the routine work one may have to do, he or she may be so trained as to rise above the otherwise narrowing effects of constant attendance upon machines or mechanical processes and be able to appreciate and enjoy the beautiful and good in nature and in the common things of everyday life. It is a great thing to be so trained as to be happy, joyous and enthusiastic—to be so educated as to know how to enjoy life and how to make the most of it in whatever station our lot may be cast.

Machine-Shop Practice Has Its Place.—Since long and costly experience has demonstrated the greater educational power of hand operations, the time has come to relegate machine-shop practice to its proper place. In the technical school or trade school, it serves a remarkably useful purpose. That purpose is to impart to the youth who expects to be a mechanic or an engineer the expert training and practical knowledge of machines and processes employed in his trade or profession. Hence there is even more necessity for trade schools, engineering schools, textile schools and similar technical institutes than there is for colleges of medicine and surgery, divinity or law. But just as there are better means of giving elementary and high-school instruction mentally than that of introducing the studies that specially qualify the doctor, lawyer or minister for their professions, so there are better exercises for imparting real manual training to the youth than the trade processes and machine methods so important to the specialist in mechanics, steam or electricity.

In technical schools for special pupils, machinery of various kinds and the use of power (electricity or steam) may be employed with reason, but I must be understood here to protest only against the misuse of these things during the early stages of many boys' lives. Before boys are 15 or 16 years

PLATE TWENTY-SIX

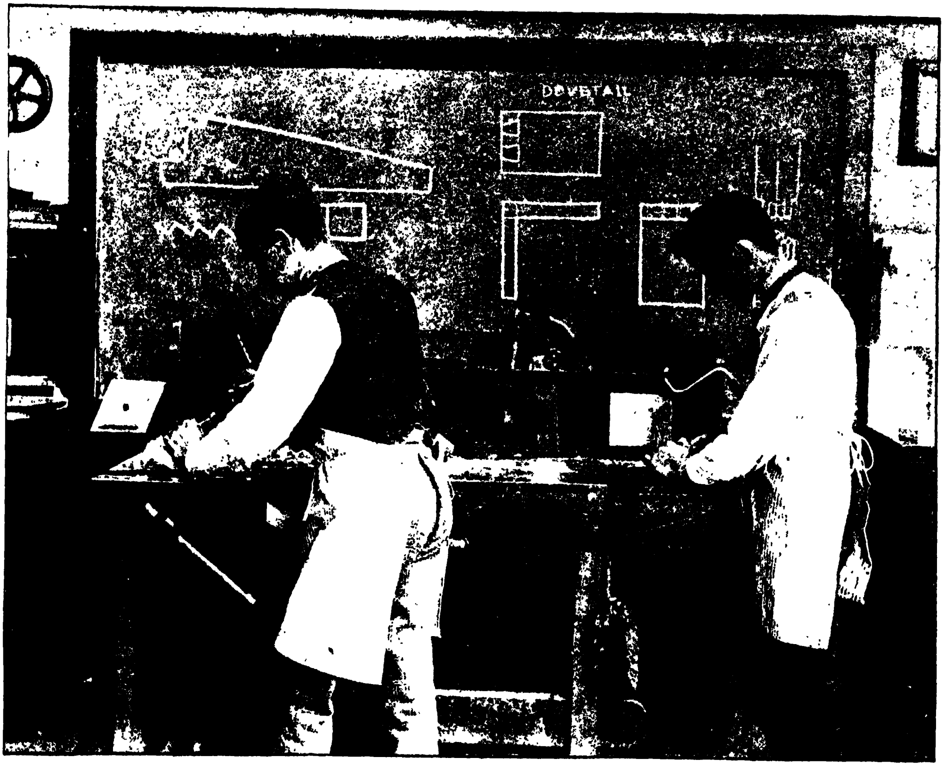


Illustrating Roof Construction

1—King Post Roof Truss   2—Truss for Curb Roof

of age, if they have had real manual training any good teacher can pick out the ones suited to be engineers and mechanical workers. Their capacity in these directions will then have shown itself. These, of course, can enter

Illustration 370



Wood Working

The first boy is cutting a dovetail, and the second boy is sharpening a chisel; correct positions are shown.

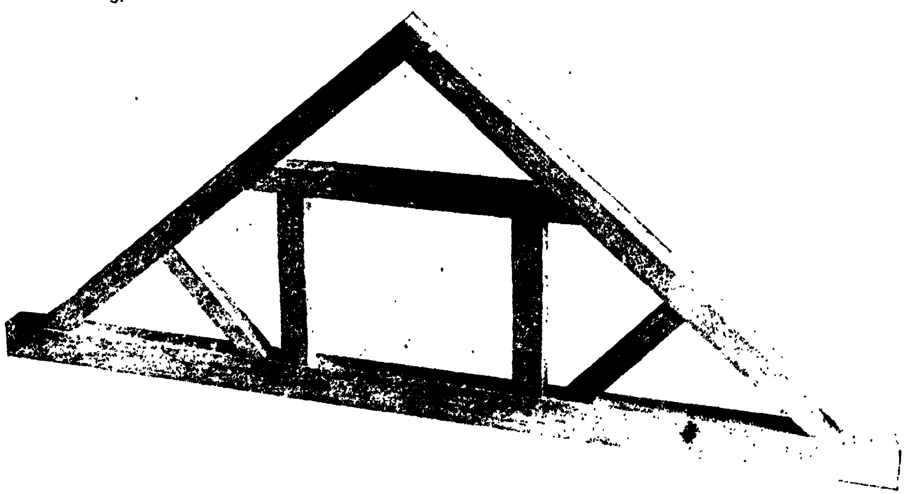
the special or trade schools, but to give machinery and machine work to large classes of young boys irrespective of their capacity and dispositions, before they have had real manual training and a certain amount of art work, is as foolish educationally as to make them all carpenters only.

Large Economy.—This point cannot be too strongly emphasized in order to correct a prevailing false notion about manual training. It also shows that a costly equipment of machinery is not necessary for an ad-

vanced manual-training school, and this demonstrates the feasibility of a far more general application of manual-training methods than has heretofore been thought possible. We see too that the introduction of rational methods of manual training in cities now provided with machinery in their manual-training departments, will pave the way for utilizing such equipments of machinery for trade schools or technical institutes, thus accomplishing another good object at a minimum of expense.

This inexpensiveness of equipment for the mechanical department of our manual-training method is all the more important when attended, as it is, by better results. How cheaply this department can be fitted up, as contrasted with the expensive machine-shop plan, may be inferred from the list of tools for a room large enough to accommodate twenty benches, given

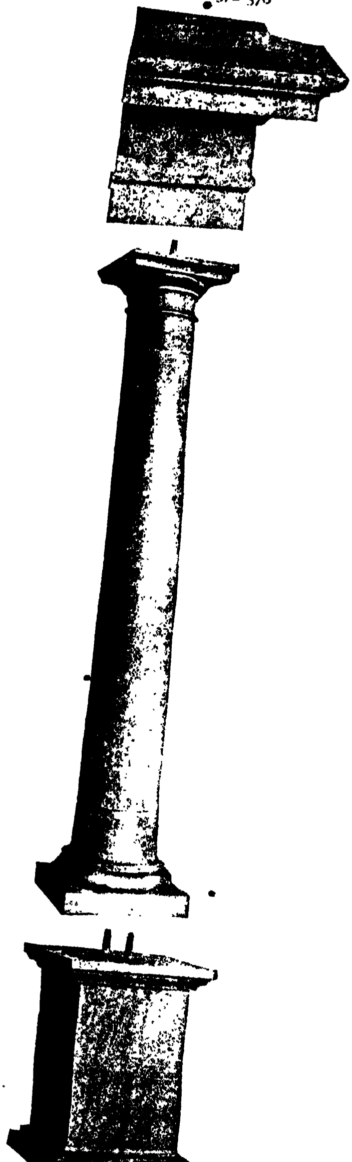
Illustration 371



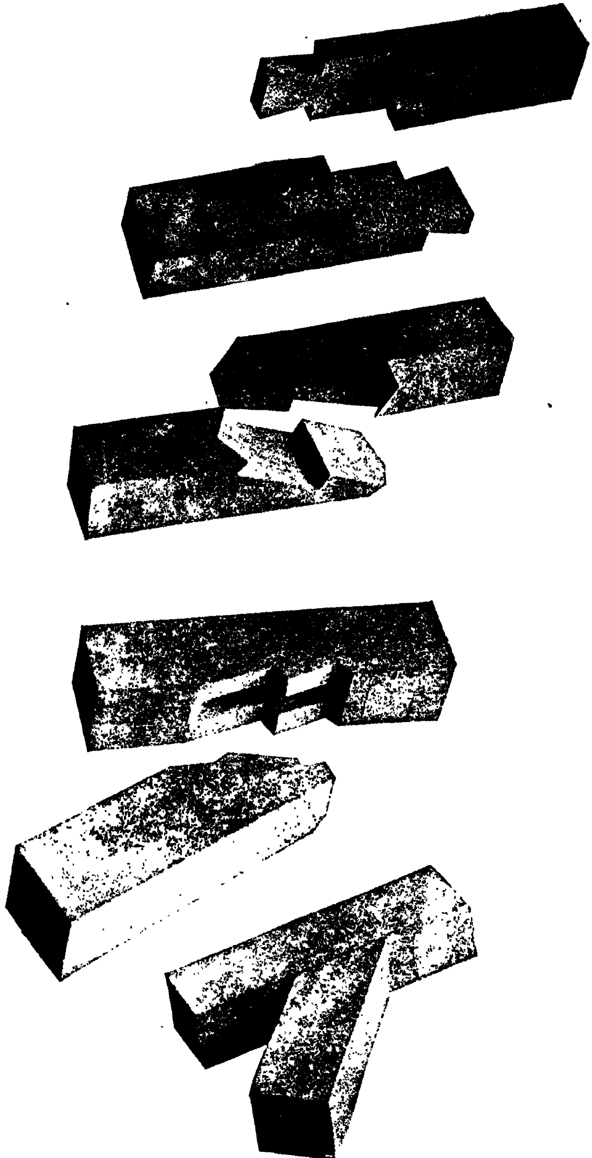
Queen Post Roof Truss

at the close of this chapter. Twenty pupils will form a suitable class for one instructor, and 300 pupils can receive one and a half hours' lesson in one week during sessions from 9 a. m. to 2 p. m. The list has been found by experience to suit classes of high-school boys, and to be reasonably complete.

Illustrations 372-376

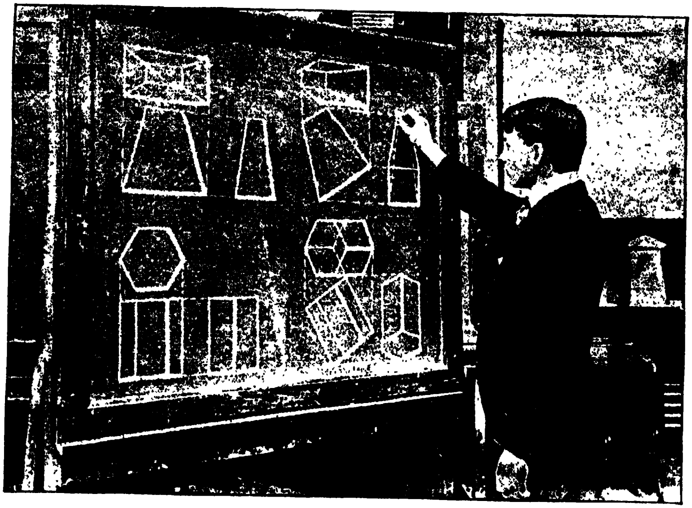


Model of Architectural Column
Base and Entablature



1—Dovetail Scarf Joint
2—Scarf Joint
3—Complex Mortise Slip Joint
4—Simple Mortise Slip Joint

Illustration 377



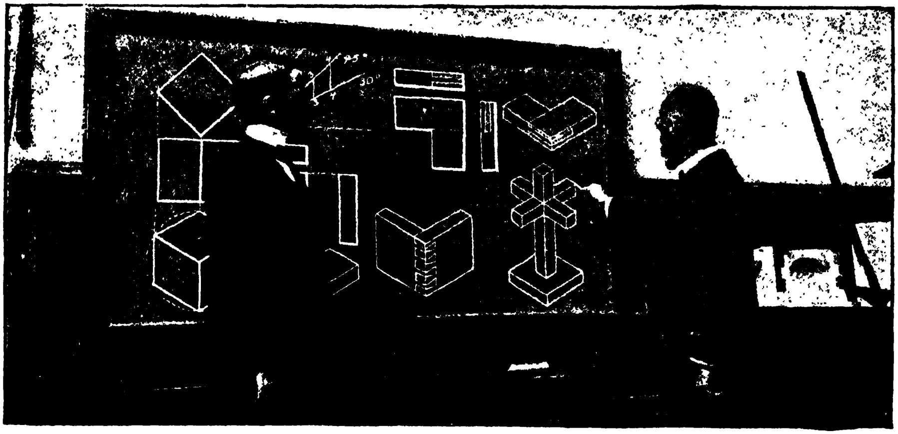
Pupil drawing projections free hand

Use of Head Work.—Believing that one who lacks practice in skill cannot become skillful, we do not substitute machines for skilled operations. Even round forms and their modifications are made by hand with hand tools, instead of being turned upon a lathe. This compels the development of a skill of hand and eye not possible to those who make similar forms only on machines. And this makes the hand more ready to work a machine skillfully when necessary. In short, we get a co-ordination of hand, eye, and mind by handicraft that no amount of machine work will compensate for. Along with mechanical precision we also get an artistic excellence of execution and encourage originality of conception not possible with mechanical repetitions, or repetitions of forms made mechanically.

Rotation of Work.—In this branch of manual training pupils rotate from mechanical drawing to work in wood during each lesson, just as in their previous training they rotated the branches of drawing, modeling and carving. Do not let them take separate courses of one or the other. The best plan is to correlate the two branches by making the pupils draw the forms in their various stages and then construct them, of course giving thorough instruction in use of tools and instruments first.

The abstruse ideas embodied in working drawings, plans, sections, etc., should become as familiar to the pupils as their previous studies have made them familiar with common forms. Pupils should become accustomed from the beginning to making and reading these drawings and ten-

Illustration 378



Isometric Drawing

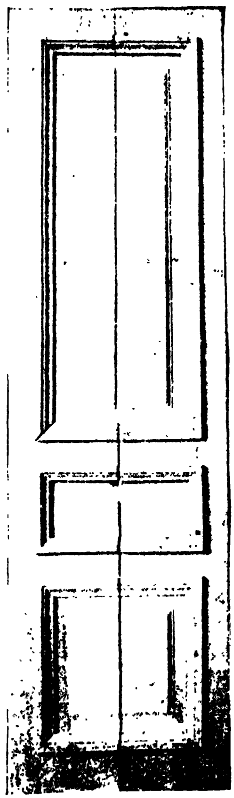
A demonstration in isometric drawing, the cube and various points are being explained.

dering them in material. The planning should be part and parcel of the doing. Only in this way will the youth grasp the vital connection between the two and be able to make the most of it. A course in mechanical drafting dissociated from the execution of the work, is as deficient educationally as freehand drawing which is not correlated with other school work. It is as barren of results as to expect a love of nature or of the beautiful in art to be created by the drawing and contemplation of stupid wooden blocks and the type forms by unwilling pupils.

Objects of Instruction.—The object is to give a deep and comprehensive training, rather than a detailed and one-sided mechanical education. It is not possible to teach a part of all the many pursuits, but it is possible to teach processes which are the best for them all. Thus in wood working, we do not give a detailed view of every process and every tool, but we give a thorough training in the principles, and facility in using the most

important tools. A pupil ought to know that there are classes of tools, and should get a logical understanding of the use and possibilities of the principal tools in each class. If we give instruction in a great variety of tools, we defeat the purpose of this work. The tendency to teach tools instead of processes and skill, seems to be universal. We must adhere to fundamentals, we must teach the pupils to discern between the important and the trivial, the fundamental and the accidental.

Illustration 379



Model of Door.

This is made in wood and is divided in the center to show construction. The sections are dowelled and fit together.

Each pupil must learn that the tools in themselves are not the end, but only the means with which we shape ideas or concepts. Hence, we should acquire early such control over tools that our attention can be given to the work we have to do with them, instead of our thoughts being directed wholly to the method of using the tools. In other words, the movements with tools should be made automatic as soon as possible, just as in drawing we acquire unconscious control over the muscles and nerves that guide chalk, pencil or brush. It is only when we have obtained this automatic action that we can concentrate our entire energy to putting thought into work.

Put Art First.—In some systems, wood carving is taught in connection with joinery and cabinet making, and is taught in the same mechanical fashion. This is radically wrong. Wood carving is as distinct from woodwork as freehand drawing is from mechanical drawing. Wood carving should always precede cabinet making, and be taught in connection with clay modeling and free hand drawing. In the principal manual-training schools, the mechanical product is given chief prominence, and such work is generally good, but the artistic product is very poor, in many schools receiving no recognition at all. The art part, which is the vital part for the young, is neglected to develop mechanics. Introduce mechanical work only after a thorough elementary training in art and manual dexterity.

A Good Teacher is of more consequence than good tools. The teacher should be a master of the method and of all the exercises in which he assumes to instruct. Too frequently, committees and others think a

Illustration 380

House Building

A lesson on stairs. The house is the result of the combined efforts of four boys. All the joints in the background have been made by the pupils.

skilled mechanic is the only proper instructor in this branch of manual training. It would be difficult to make a greater mistake. I have never known a carpenter or mechanic able to teach this work in the right way. In many such classes the boys make plenty of joints and enjoy it thoroughly, but the educational value of the work is lost sight of and the mind and the hand are not intimately related to the things, facts and processes of life as they should be.

If a true teacher is taken, however, instead of a mechanic, even the subjects of glue, nails, etc., will be made an avenue for much fruitful discussion and instruction. Every point will be made of interest, and its connection with other phases of work and study will be comprehended by the pupil so that he can make actual use of his knowledge. Unless the exercises are correlated in this way with the other studies, bench work has no business in the schools.

Our Course in Mechanical Drawing includes the ordinary course in most schools, the study of mechanical perspective, and of the architectural

Illustration 381

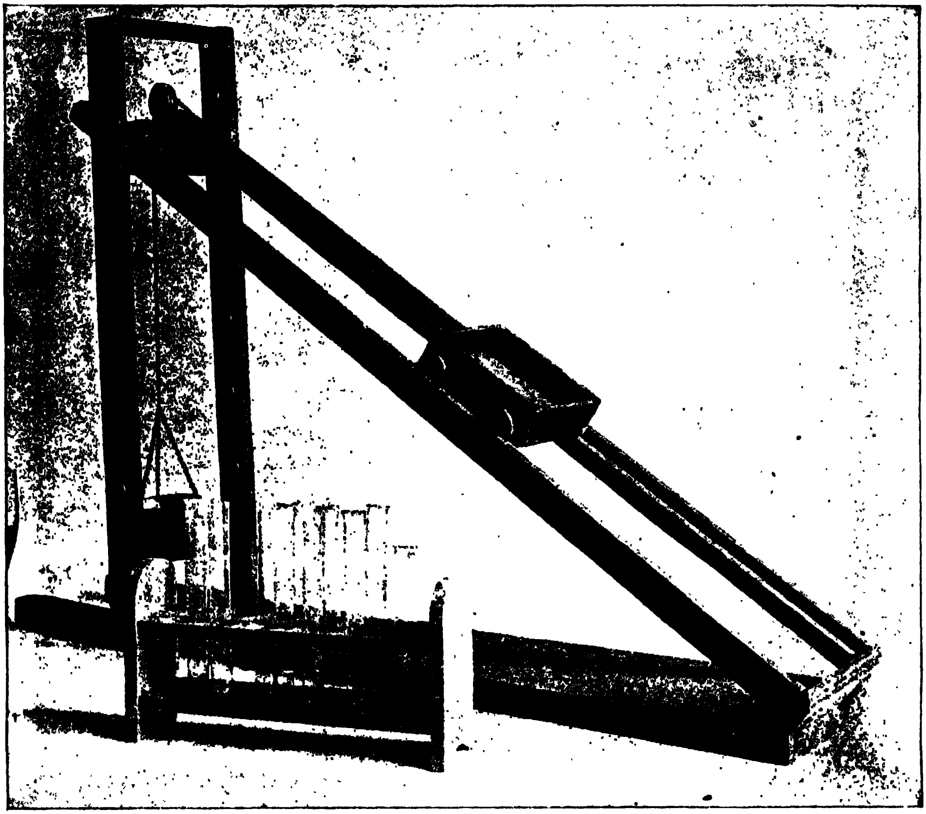
Wood Working

Pupil applying try square to a planed surface.

styles, and some designs and construction. In education, where we must consider the development of the esthetic principles, as well as the practical elements, such a course will be found more instructive than the usual one-

sided and totally mechanical course. The teacher should strive to give a thorough understanding of the principles of mechanical drawing, but should not enter into a lengthy and detailed discussion of machines.

Illustration 382



Apparatus for Various School Purposes

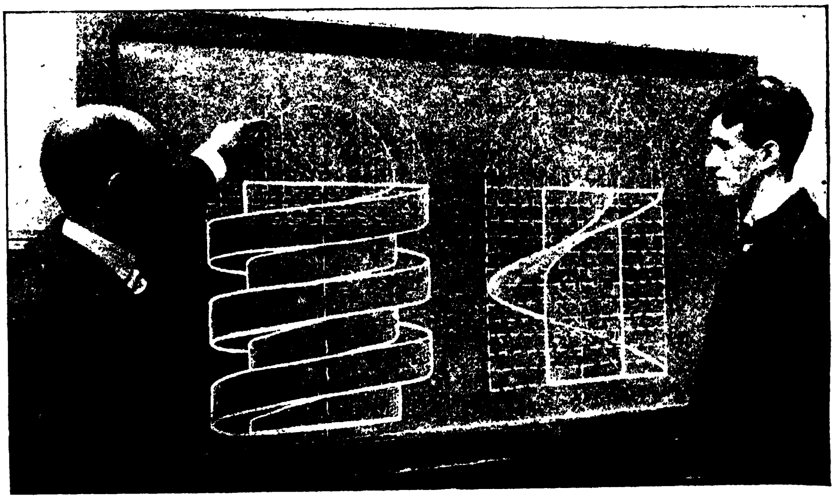
The boys design and manufacture considerable of the laboratory and other apparatus needed in the school Such work is not allowed at the expense of the educational object of this training. This model is to illustrate the principle of the incline plane and the principle of friction in physics.

Parallel and angular perspective are dwelt upon at length, architectural styles are similarly treated, and architectural design and construction are discussed. Our object, at this stage, is not to make draftsmen or architects, but to open up the minds of the pupils to the immense possibilities and the

intrinsic beauty of the subject. This course will be as valuable to one desiring to devote his life to fine art, as to one who wishes to become a mechanical engineer, an architect, draftsman, farmer, etc., while at the same time it embraces real manual training.

Thus far, the chief attention has been given to the development of manual skill, co-ordinated with eye-training and mind-culture, and to the study of form, historical ornament, the use of water-colors, and charcoal, etc. Now, when the abstractions included in projections, sections, developments, shades and shadows, and angular perspective, are dealt with, it is surprising how quickly and vividly the pupils will comprehend these subjects, and what freedom and breadth they will exhibit in their renderings. To a pupil with-

Illustration 383



Mechanical Drawing

Demonstrating the principle of a screw and showing application of helix.

out this previous training, a mechanical drawing is a dead object; the execution of such a drawing will be devoid of all artistic beauty, and the condition of the mind of the pupil will, generally, be at a still lower stage; thus the soul and the imagination are confined and restrained, and the possibilities of which they are capable are not even opened to view.

The course begins with a discussion of the instruments. One of the best exercises, and one which brings into use all the tools, is the construction of some simple frets or geometric ornaments. This is much better than a simple exercise in drawing lines, or proceeding at once with some geometrical problem, or working drawing, and gives freedom, and a logical understanding of the instruments and their use.

Geometric problems are then taken. This will be an additional exercise with the instruments. Working drawings follow; first, of a very simple nature, neatness and accuracy being the essentials at this stage; later, more complex figures may be taken, such as joints, etc.

Throughout the entire course there is every opportunity to consider the individuality of the pupils. When the teacher is discussing any subject, the principle should be made prominent, and the pupils should make many notes and sketches. Those who exhibit more aptitude, should make more complex drawings. In this way, each pupil may make a different drawing,—all, however, showing the same principle. With proper management, this will not conflict with the necessary uniformity of class work.

Isometrical drawing, the simplest mechanical perspective, is taken next. This will be found useful in illustrating constructions, projections, and penetrations. Sections and developments follow in order. The choice of particular subjects should be left to the pupils as much as possible. The teacher, at all times, should exercise the greatest care and discretion in the selection of typical figures.

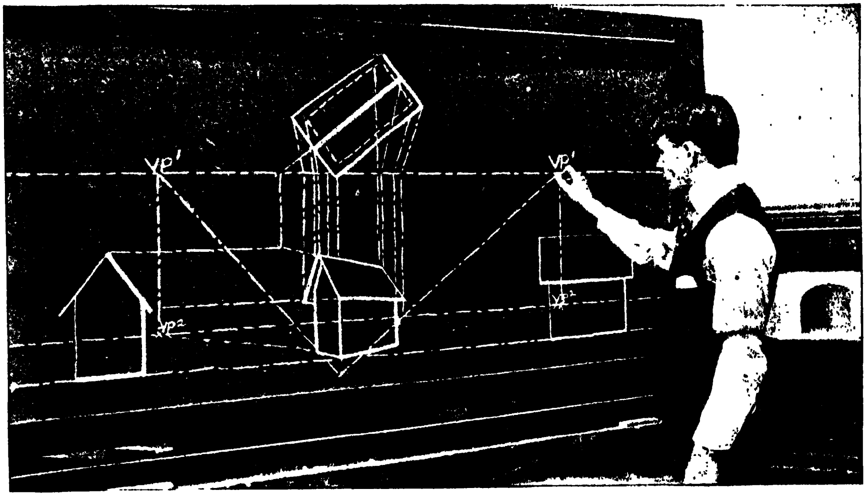
By this time the pupils will be found to work with considerable freedom and insight into the principles involved, and will be ready for the more advanced exercises. The mechanical units are now taken,—screws, nuts, propellers, cams, gears, etc. As all the pupils have had a previous experience in water-color and charcoal, they should, at various intervals, make shaded or colored drawings. Of course, too much time must not be consumed in this way. The class should, at times, get some practical experience. Visits to large machine shops and constructive establishments should be made; in many cities there are abundant opportunities to visit large industrial plants, locomotive and electrical machine factories, and shipyards, etc. These excursions can be made very interesting and will prove highly valuable to the students.

Tracing and blue-printing should be treated at the best opportunity.

Shades and shadows, parallel and angular perspective, should receive a great deal of attention, as they are valuable educational subjects.

Architecture is taken next, the chief aim being to give a good understanding of styles, and their characteristics. This is a most valuable study, for, at all times, the character of a period, or a nation is embodied in its

Illustration 384



Freehand Perspective
The boys are given frequent opportunity to make large drawings in perspective as above.

buildings. A good set of architectural models is almost indispensable for this work. The students should visit different typical buildings, and some time should be spent in instructive discussion. Some time should also be given to planning and construction. Pupils should not be allowed to make actual copies of architectural drawings, or plans of houses, but should make original plans of their own, involving individual ideas. No matter how crude in the beginning, this gives them concrete ideas and experience. The same is true of machine drawing; the pupils should not be always copying drawings of machines, often beyond their comprehension,—as is sometimes done,—but should work at principles, on simple forms which they fully understand, and that are typical. Much time is wasted in fancy lettering, and over unnecessary detail.

Blackboard Work should be carried on as much as possible. All the pupils in the constructive departments should work at intervals on the blackboard. All the ordinary geometric forms and simple constructions should be drawn full size and freehand, until memorized. Sketches should also be made of architectural details, plans and styles, and the forms should be repeated and modified many times.

The full benefits of such a course can be bestowed only upon pupils who have had the previous elementary art training. To them, the artistic

Illustration 385

A Model for Building

Construction showing principles of "vaulting."

elements will appeal as much as the practical ones. They will leave school with their minds opened, with skilled and responsive hands and eyes, and with a developed love for the beautiful and the true.

The teacher is as yet comparatively rare who is capable of giving this

phase of rational manual training, just as the teachers are not yet numerous who have mastered drawing and modeling in connection with school work, but the sphere for such teachers is large and increasing. No branch of education offers so fine an opportunity for teachers, both for usefulness and for pecuniary reward. And the teacher who masters both the art side and the mechanical side of real manual training will have the still wider opportunity that awaits the real master in any profession.

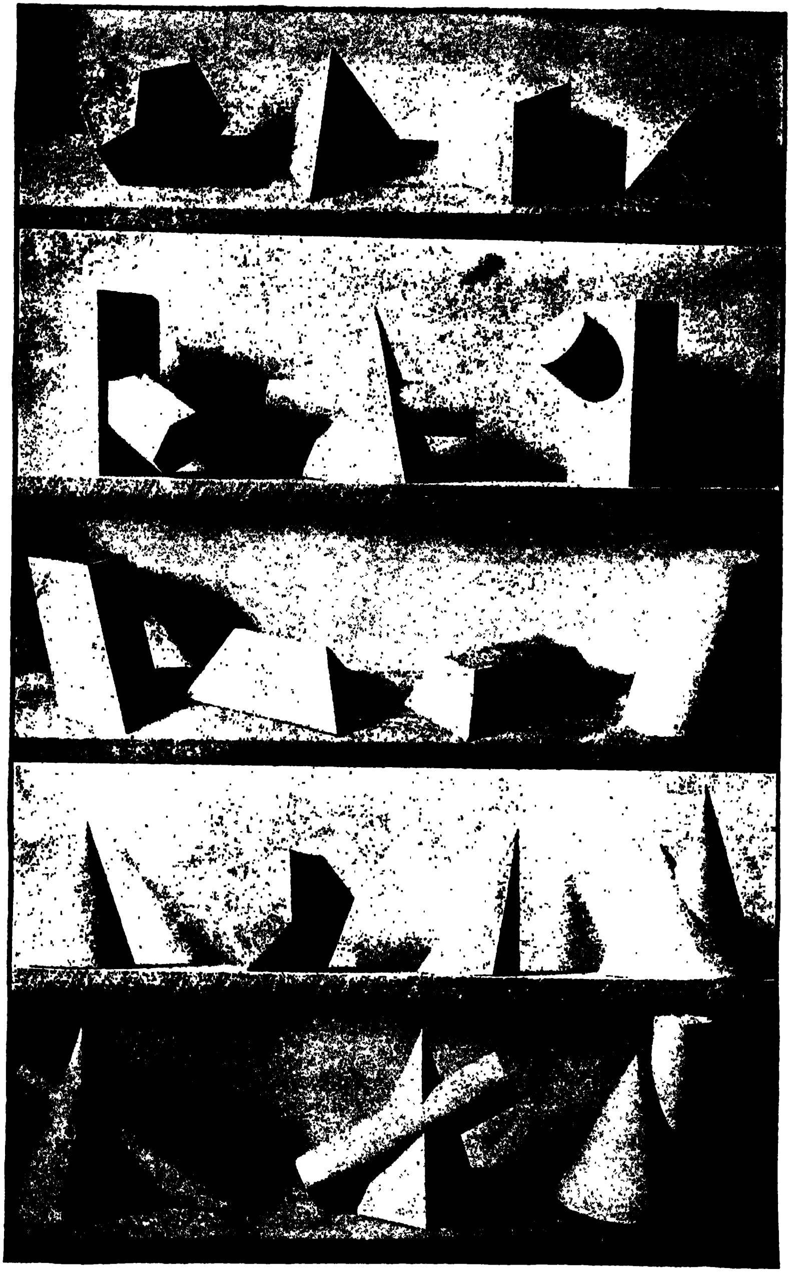
In Teaching the Mechanical Side of manual training, thorough instruction on and discussion of all tools, materials, and forms made should be constant. Nothing should be taken for granted. I have frequently seen boys making a joint or piece of work without an itelligent idea of its name, use or purpose, and this is also true in regard to tools.

Every tool should be explained thoroughly and its use made manifest in as many directions as possible. Lessons should also be given on the various woods and materials used (glues, varnishes, nails, etc.), and upon the use and applications of the constructions made. Upon all these subjects, and other phases of the work, the true teacher will have become thoroughly informed by actual experience mainly, for no manual or text book exists or can be written that will take the place of the knowledge the teacher will acquire by actually doing all branches of the work.

It is of great importance that the course should contain exercises in making the principal typical forms. Don't attempt too many forms, or amateur or freak forms,—a weakness in other methods. This error is caused by an undue desire to show finished product and useful articles. While this is an important factor, it should not dominate the desire of obtaining the greatest amount of skill and training.

Each pupil should be provided with a note book and sketch book, in which he should write descriptions of the tools and their uses, and also make rough drawings and an isometrical view of each exercise.

The Simpler Exercises.—After learning the manipulation of the most important tools and appliances, the pupil is ready to construct the simpler forms of joints—first, the plain butt, miter, half and slip joints, later the varieties of these. These exercises are all very valuable and they are ideal forms at this stage. It is not necessary that each pupil should make a graded series or even one of each of these, but he should get a thorough understanding of them all. It will be sufficient if he makes



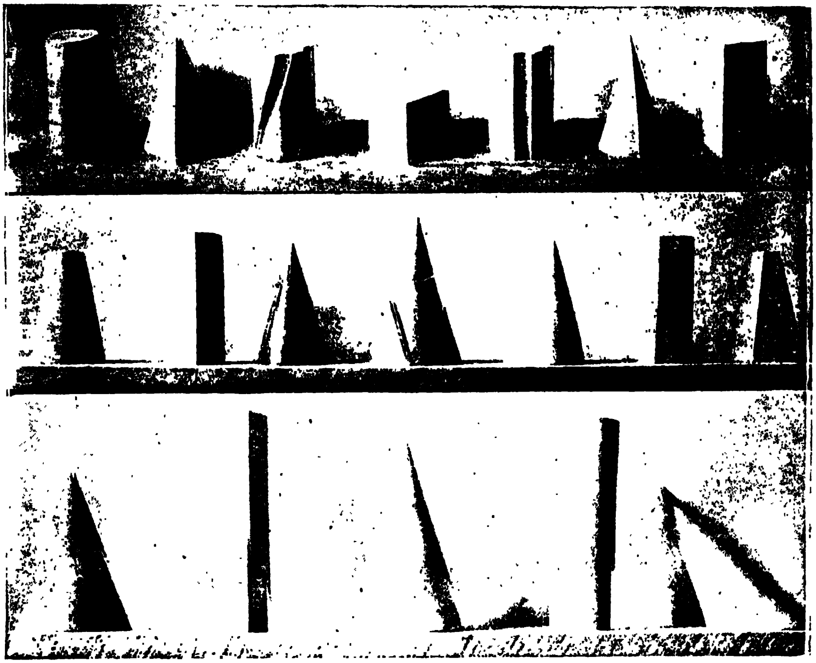
Simple and Complex Geometric Models

These are models which may be used to good advantage in geometry and drawing for light and shade, and in mechanical drawing, in teaching intersections, sections, surface development, etc. They may be reproduced in wood by hand work, as exercises in manual training.

three or four of the joints—in this way the class may easily be treated individually.

Another feature of value is the construction of geometric forms, such as cubes, prisms, cylinders, cones, etc. (Illus. 386.) The simplest of these

Illustration 386



Wood Working—Geometric Forms

These geometric forms have been made by hand by the boys without lathes. They are made to scale. The cone is made in several sections and fits together, showing the conic sections.

forms are taken—the cube, the various prisms, the cylinder and the frustrums. These forms are especially valuable as exercises, because they require logical thinking and render necessary various consecutive steps in their construction, as well as yielding unusual manual skill. It is not necessary that the pupils should make all the geometric forms—a few of the type forms made to accurate scale will be sufficient.

After this pattern making may be taken up. Beginning with a thor-

ough discussion of the subject, the pupil is then ready to construct some simple pattern, such as wrench, crank, sledge hammer, head, brace, etc., a few samples of which are shown in the initial letter on page 305.

By this time each pupil is thoroughly acquainted with all the tools and

Illustration 387

A Lesson in Perspective

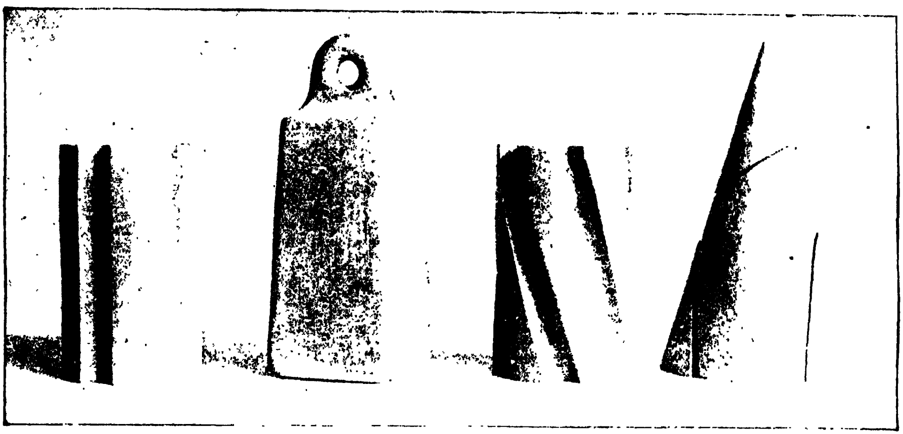
A series of frames are made and used in the class rooms for demonstrating perspective in various ways. The object, with ground plan picture plane on glass, vanishing lines, point of sight, etc., are shown in various positions. The teacher explaining parts.

processes, and has some general experience. At various stages of the course, attention should be given to sharpening tools. Pupils should master this work, without which the best tools soon become useless.

Advanced Work.—Pupils are now ready to take up the more advanced exercises, and very accurate and fine work may reasonably be ex-

pected. Next in order may be taken the various complex joints, such as the mortise, dovetail, brace joints, the scarfs, and varieties of these. Then advanced geometric forms may be taken—pyramids, cones, grooved cylinders, cone in sections, etc. (Page 326.) Advanced patterns come next, such as model for weight, cast-iron bracket, fly wheel, and parts of machinery (Illus. 388).

Illustration 388



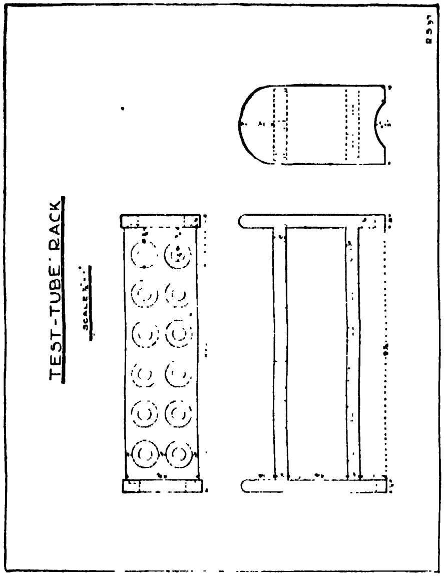
Wood Working

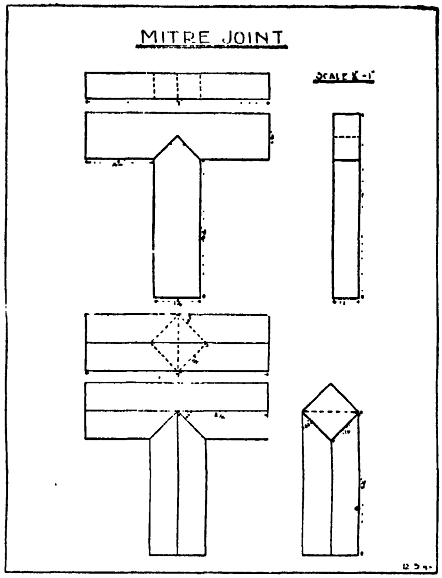
These are forms and patterns in wood cut by hand tools entirely by high school boys. The cone shows the conic sections, and is doweled so that it comes apart.

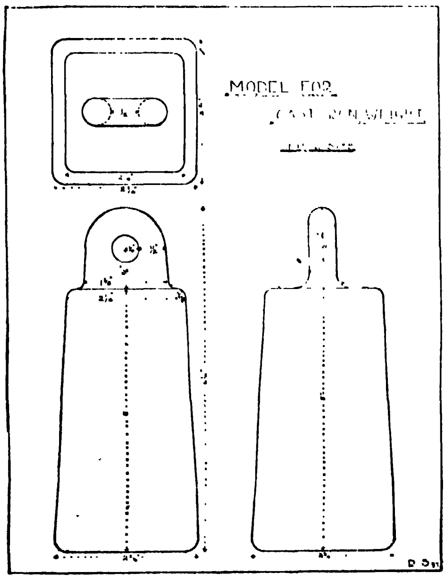
In these more advanced exercises the work may be carried on individually. Since some pupils will have acquired unusual skill, they ought to make elaborate exercises. Those who have not developed so readily should be given exercises best suited to their stage.

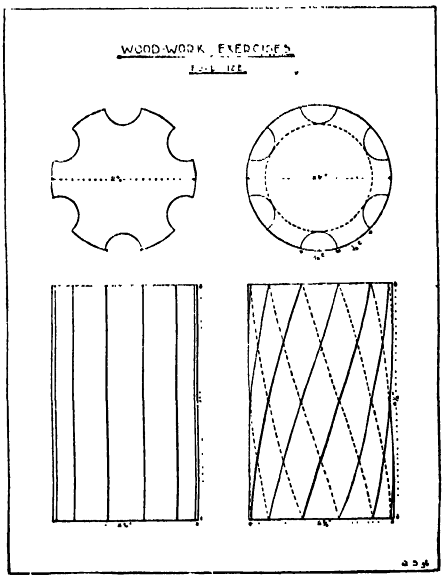
The greatest skill is typified in advanced construction. This embraces frames, cabinets, furniture, sashes, doors, roof trusses, etc. Sometimes it is well for an advanced class to combine in constructing some large project, such as a frame house (page 309), or a large piece of furniture, similar to a vestment case (page 282), or case of closets for museum, or bookcases, etc.,—anything suitable for school purposes.

It is not necessary that every piece or part of the work should be made by the boys. Duplicate parts can be cut out at the mill, turned work, if







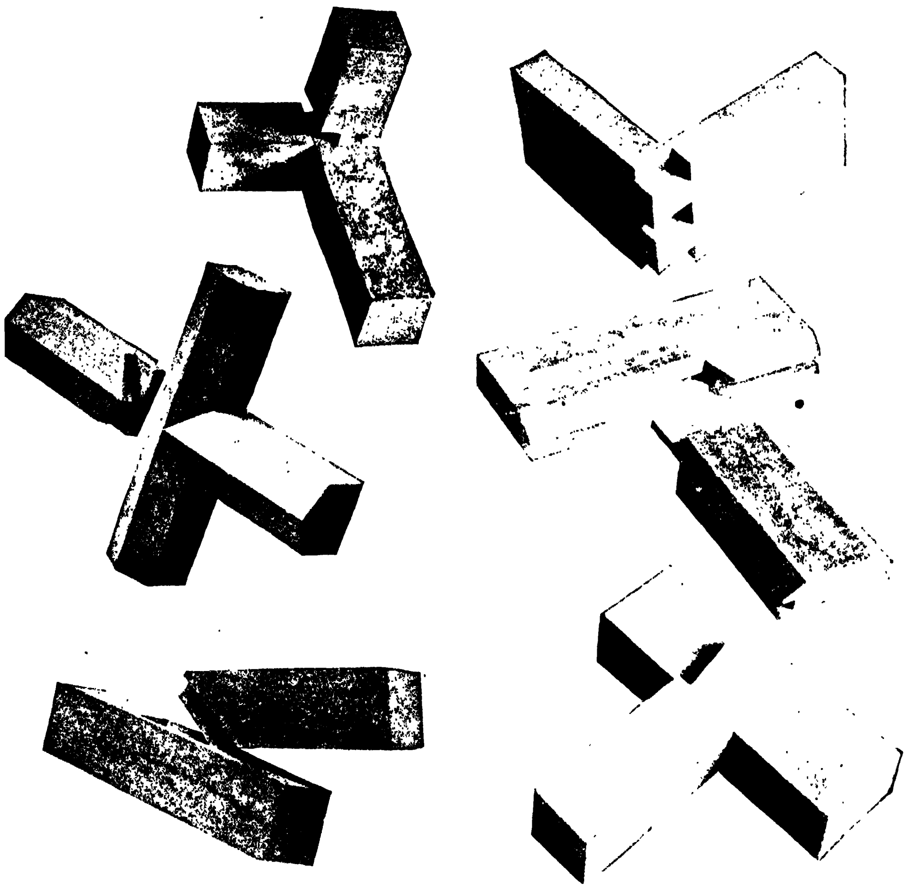


Drawings for Wood Working

Working drawings of typical exercises, one-fourth actual size. Each pupil makes a drawing of the object or a sketch thereof in his note-book. The model for cast-iron weight is to be cut entirely by hand. The test-tube rack, to be used in the chemistry class with other apparatus, is made by the boys. The advanced geometric forms, shown at bottom to the right, are to be made to scale without the use of machinery or lathe. The complex joint drawing shows the principle of the mitre.

required, can be ordered; doors and sashes can be framed by machinery at the mill, but all the draughting, detail drawings, filling and constructing

Illustrations 389-394



Complex Mortise and Tenon Joint
Complex Mortise and Tenon Joint
Mortise Slip Joint

Dovetail Joint
Mortise and Tenon
Halved Dovetail

can readily be done by the boys in a class of this kind. Nearly all the elaborate apparatus in wood used in teaching physics can be made by the boys in a class of this character, and also many useful things required in laboratories.

WOOD-WORKING COURSE.

1. Use of tools and methods.

   Tools—Rip saw, cross-cut saw, Jack plane, smooth plane, Try square, gauge.

   Squaring to right dimensions.

   Working with scribe knife, block plane, back saw.

   Beveling with plane.

   Sandpapering.

2. Simple joints.

   Butt joint, miter joint, half joint, slip joint, varieties.

   Laying out work—Gluing and clamping.

   Use of bevels, chisels and chalk.

3. Sharpening tools.

   Grinding, slip stones, shellac, alcohol, glue, varnish.

4. Simple geometric forms.

   Cube, square prism, hexagonal prism, octagonal prism, cylinder.

   Use of compasses, planing round, etc.

5. Simple constructions.

   Frame, wall bracket, brace, box, etc.

   Brace and bit, nailing, firmer gauges, scraper.

6. Easy exercises in pattern making.

   Sledge hammer, wrench, crank, bracket, quoit, grate and other simple exercises.

7. Complex joints.

   Mortise joint, dovetail joint, brace joint, varieties of these.

8. Advanced geometric forms.

   Pyramids, square hexagonal and octagonal, cone and frustrum.

   Cylinder with grooves, cone in sections.

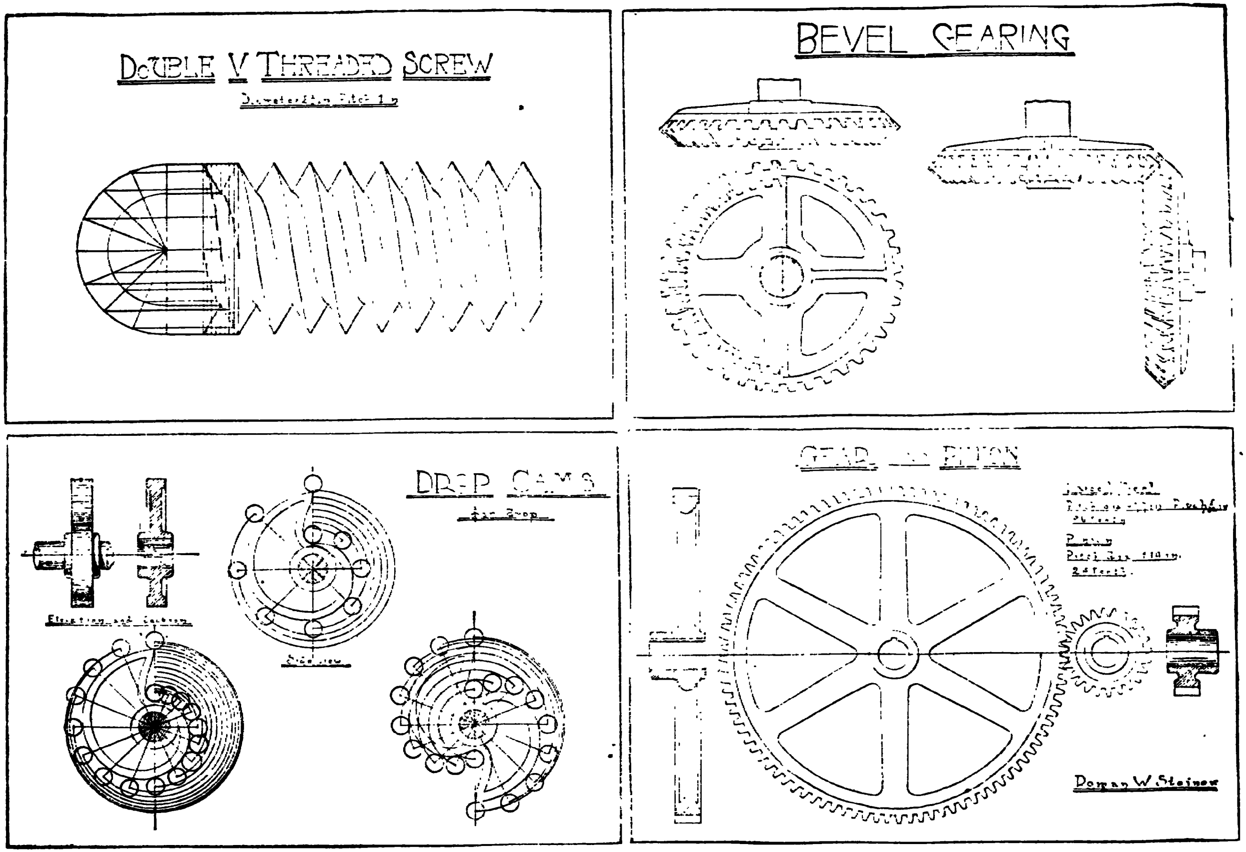
9. Pattern making.

   Fly wheel, weights, cams. Details of machinery.

10. Advanced constructions.

   Brace, roof trusses, bridges, doors, frames, frame house, furniture.

PLATE TWENTY-NINE

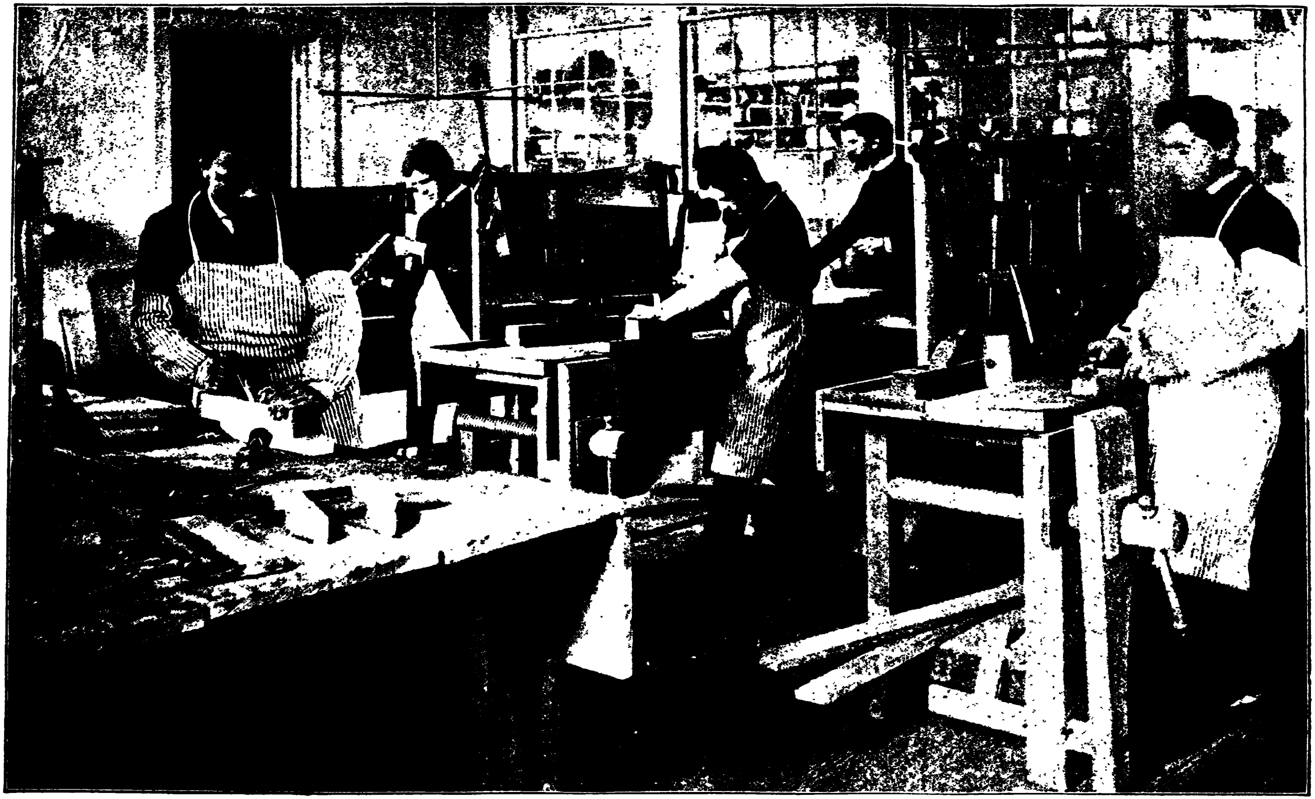


Mechanical Drawing

Reproduction of work of pupils (reduced). The V-threaded screw shows true curve of edges. Three different drop-cams show principle of cam motion. **The other two are advanced mechanical drawings.** Each pupil makes different drawings, applying the principles learned.

Tools for Wood-Working Department.—Equipment for a class of twenty pupils:

- 20 benches
- 20 iron smooth planes
- 20 wooden jack planes
- 20 iron block planes
- 20 back saws
- 20 nail hammers
- 20 try squares
- 20 marking gauges
- 20 scribe knives
- 20 bevels,
- 20 screw drivers
- 20 mallets
- 20 oil-stones
- 20 steel oilers
- 20 rules
- 20 bench hooks
- 20 dust brushes
- 2 cross-cut saws
- 2 rip saws
- 2 turning saw frames
- 2 keyhole saw pads
- $\frac{1}{2}$ doz. turning saws
- $\frac{1}{2}$ doz. keyhole saws
- $\frac{1}{2}$ doz. firmer chisels, $\frac{1}{8}$ to 1 inch
- $\frac{1}{2}$ doz. firmer gauges, $\frac{1}{4}$ to 1 inch
- $\frac{1}{2}$ doz. spoke shaves
- $\frac{1}{4}$ doz. rabbet planes
- $\frac{1}{2}$ doz. carpenter's pincers
- 2 doz. saw files
- $\frac{1}{2}$ doz. compasses
- 1 combination plane
- 2 bit braces
- 2 auger bits, each $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ inch
- 1 doz. German bits
- $\frac{1}{2}$ doz. center bits
- 3 doz. rose countersinks
- Large iron square
- 1 grindstone
- 1 set slip stones
- 1 panel gauge
- 1 trammel
- 1 doz. files
- $\frac{1}{2}$ doz. cabinet scrapers
- 1 hatchet
- $\frac{1}{2}$ doz. brad awls and nail punches
- Glue pot and furnace
- Shellac and alcohol
- Lamp black
- Sperm oil
- Chalk
- Paint brushes
- Sandpaper
- Four trusses
- Blackboards
- Closets
- 3 doz. handscrews
- Woods: White pine, poplar, cherry, mahogany, pear, walnut.



Carpenter Work—The Old System of Manual Training

This picture, made in 1882 at the Public Industrial Art School, is interesting because it represents the first attempt at woodwork in the public schools of Philadelphia. Giving the lessons myself, only a few terms were necessary to prove the futility of these exercises as real manual training. The same rooms are now used for the methods described in this book, with results in every way vastly superior.

COURSE IN MECHANICAL DRAWING.

Scales, T and set squares used in constructing simple geometric ornaments or frets—later the compasses. Inking and drawing. Erasing and cleaning.

I—Use of tools
II—Geometric problems
III—Working drawings
IV—Isometric drawings
V—Projections
VI—Penetrations
VII—Sections
VIII—Developments
IX—Screws, cams, gears, etc
X—Tracing and blue printing
XI—Shades and shadows
XII—Parallel perspective
XIII—Angular perspective
XIV—Architecture

EQUIPMENT REQUIRED

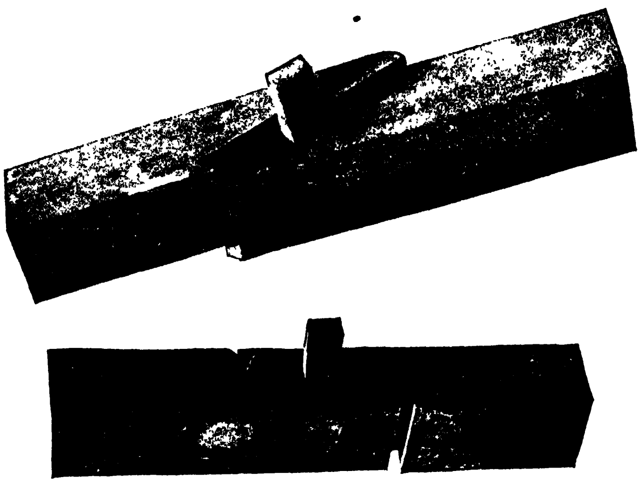
Twenty sets of instruments, including divider with pen, pencil, and needle-point parts and lengthening bar, a plain divider, steel bow pencils and steel bow pen, ruling pen with joint, box with leads.

20 adjustable drawing tables
20 drawing boards, 20x26
20 T squares
20 set squares, 45 deg. 7 inches
20 set squares, 60 deg. 9 inches
20 triangular scales
20 bottles India ink, black
20 bottles India ink, blue
20 bottles India ink, red
Portfolios, frames, water colors, etc.
40 tinting saucers
40 brushes
20 note books
Pencils, grade H. H.
Drawing paper, 17x24
20 dusting brushes
Thumb tacks
Pencil and ink rubbers
Tracing cloth, blue printing outfit

Exercises in Metal Work are prominent in some manual-training schools. Usually these exercises consist for a few terms of portions of the work of machine shop and the blacksmith shop—a little chipping, filing and fitting; molding and casting, forging and welding, ornamental ironwork and tinsmithing and perhaps plumbing. Later on the operations consists of machine-tool practice. With the exception of wrought-iron work, which readily lends itself to ornamental and artistic treatment,

such work is entirely mechanical. No artistic work is attempted, the aesthetic idea is entirely wanting. Carefully graded forms are used, and the patterns and exercises of one manual-training school can usually be found in almost every other. Even the forms made in tinsmithing are nearly all alike.

Experience with a variety of these operations leads me to believe that the proper place for most of such work in metal is in the trade schools. At most of the manual-training schools the authorities themselves will state that "no trades are taught." Why then give portions of trade operations when fundamentals should or could be taught? If the work is given for its educational value, this should be done. A large part of the educational value is secured in the construction course just given in brief. The operations that are not thus covered are mainly of a trade character, rather than educational in their function. In many manual-training schools the present tendency is to build steam engines, dynamos, bicycles, etc. Too many boys are spoiled and too much energy is thus wasted. I have known all individual and educational efforts of pupils and teachers of an entire school to be wasted for a term this way. Much more attention should be given in manual-training schools to the artistic use of various metals, in wrought-iron, in brass, in molding and casting, in forging and hammered work.



IN CONCLUSION

The author extends his sincere thanks to a number of pupils in his schools and several friends who have aided him, directly and indirectly. Special appreciation and recognition are due the following:

MR HERBERT MYRICK, for valuable aid, advice and assistance throughout the entire work.

PROF W. S. LONG, in nature study.

MR BERNARD UHLE, in the carving.

ROMAN STEINER, for various drawings and help in chapter on construction

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THE PUBLISHERS' WORD

This book has been primarily a labor of love with the American publishers. It describes methods that have been successfully applied with many thousands of pupils and teachers in public, parochial and private schools, art classes, reformatory institutions, etc. At the World's Columbian Exposition, Mr. Tadd's working display of his methods was awarded the only medal "for excellence and unique method of teaching drawing and its application to clay and wood." The judges were Russian experts in industrial education and manual training. It is further significant of true merit, that a different set of judges should have awarded another gold medal to this work as exhibited by the Roman Catholic high school of Philadelphia in another and distant department of the exposition. The report of the United States Commissioner of Education for 1894 says "the exhibit of this school was a surprise," and devotes more space to it than to all the Philadelphia art schools and colleges combined.

This school also received the lion's share of space and commendation in the voluminous report to the Swiss government by its accredited delegate, Mr. Leon Genoud, director of the Museum of Industry and the Pedagogium, Fribourg. Mr. Tadd was invited to explain his methods to the British Association for the Advancement of Science in 1896, and an institution for teaching these methods has since been successfully inaugurated at Liverpool, while it is rapidly spreading throughout the United States. In consequence of these and other indorsements, much inquiry for "the natural education" has come from leading educational bodies, not only in the United States, but in Norway, Sweden, Switzerland, Belgium, France, Germany, the United Kingdom and Australia. The present work is partly to satisfy these and similar inquiries.

The American publishers offer their services to families, institutions, superintendents or teachers who may wish to adopt Mr. Tadd's methods in whole or in part. Correspondence is invited regarding competent instructors in art, real manual training and nature study, concerning opportunities for the training of teachers in this method, or about the simple and inexpensive equipment and supplies required for these natural methods in the new education. We will cheerfully co-operate to any reasonable extent in promoting the universal use of these new methods in education that are so full of promise for the youth of the world.

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